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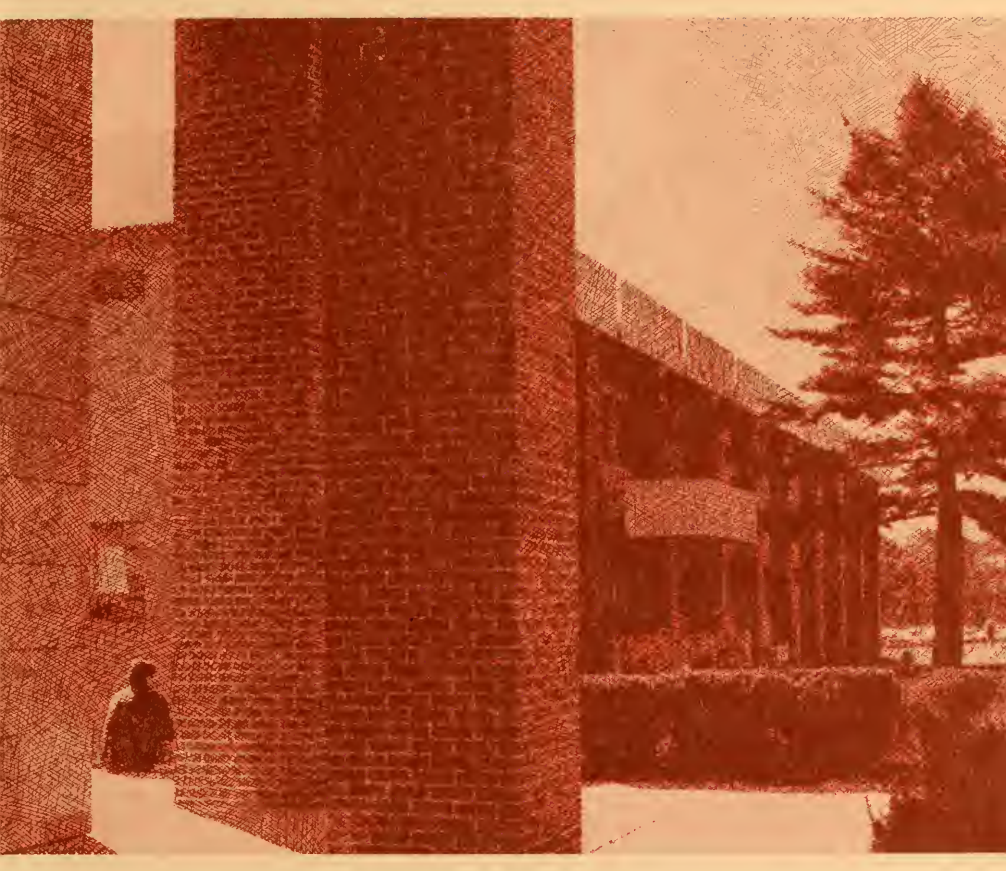

Undergraduate
Bulletin
1977–1978

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The University of New Haven does not discriminate on the basis of race, sex, religion, national origin or handicap in admission or treatment of students or in recruitment and treatment of employees.

The male generic terms appearing throughout this book refer to both males and females and are used for grammatical simplicity and semantic convenience.

The university reserves the right, at any time, to make whatever changes may be deemed necessary in admission requirements, fees, charges, tuition, regulations and academic programs prior to the start of any class, term, semester, trimester or session.

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Academic Calendar

Undergraduate Day Division

FALL SEMESTER 1977

Tuition due	Monday, August 8
Residence charge due	Monday, August 8
Orientation for 1st year students	Tuesday, September 6
Classes begin	Wednesday, September 7
Last day to ADD courses	Friday, September 16
Last day to petition for January graduation	Friday, October 14
Last day to DROP courses	Friday, October 21
Holiday (Thanksgiving)	Thursday-Friday, November 24-25
Classes end	Thursday, December 15
Reading day	Friday, December 16
Final Examinations	Saturday-Friday, December 17-23
Last day of semester	Friday, December 23
Commencement	Sunday, January 22

SPRING SEMESTER 1978

Tuition due	Monday, January 2
Residence charges due	Monday, January 2
Orientation for new students	Tuesday, January 17
Classes begin	Wednesday, January 18
Last day to ADD courses	Friday, January 27
Holiday (Washington's Birthday)	Monday, February 20
Last day to petition for June graduation	Wednesday, March 1
Last day to DROP courses	Friday, March 3
Spring vacation	Saturday-Sunday, March 11-19
Classes resume	Monday, March 20
Holiday (Good Friday)	Friday, April 7
Classes end	Friday, May 5
Reading days	Monday-Tuesday, May 8-9
Final examinations	Wednesday-Tuesday, May 10-16
Last day of semester	Tuesday, May 16
Commencement	Sunday, June 4

Evening Division

SUMMER SEMESTER 1977

Registration Period	Tuesday-Friday, May 31-June 10
Tuition due	Monday, June 13
Classes begin	Monday, June 13
Holiday (Independence Day)	Monday, July 4
First term final examinations	Monday, July 18
Second term classes begin	Thursday, July 21
Second term final examinations	Wednesday, August 24

FALL SEMESTER 1977

Registration for current and former students	Monday-Friday, August 15-26
Registration for new students	Tuesday-Wednesday, August 30-31
Tuition due	Wednesday, September 7
Classes begin	Wednesday, September 7
Last day to ADD courses	Friday, September 16
Last day to petition for January graduation	Friday, October 14
Last day to DROP courses	Friday, October 21
Holiday (Thanksgiving)	Wednesday-Sunday, November 23-27
Classes end	Friday, December 16
Final examinations	Saturday-Friday, December 17-23
Commencement	Sunday, January 22

SPRING SEMESTER 1978

Registration for current and former students	Monday-Monday, January 2-9
Registration for new students	Monday-Tuesday, January 9-10
Tuition due	Friday, January 13
Classes begin	Monday, January 16
Last day to ADD courses	Friday, January 27
Holiday (Washington's Birthday)	Monday, February 20
Last day to DROP courses	Friday, March 3
Last day to petition for June graduation	Wednesday, March 1
Spring vacation	Sunday-Sunday, March 12-19
Classes resume	Monday, March 20
Holiday (Good Friday)	Friday, April 7
Classes end	Saturday, May 6
Final examinations	Monday-Saturday, May 8-13
Commencement	Sunday, June 4

SUMMER SEMESTER 1978

Registration period	Wednesday-Friday, May 31-June 9
Tuition due	Monday, June 12
Classes begin	Monday, June 12
Holiday (Independence Day)	Tuesday, July 4
First term final examinations	Monday, July 17
Second term classes begin	Thursday, July 20
Second term final examinations	Wednesday, August 23

Graduate School

1977-1978

Last day to file Financial Aid Application for Fall trimester	Friday, July 8, 1977
Summer term begins	Monday, July 11
Last day to submit complete application for the Fall trimester	Monday, August 1
Summer term ends	Wednesday, August 24
Registration for new students for the Fall trimester	Thursday-Friday, August 25-26 4:30-7:30 p.m.
Fall trimester classes start	Tuesday, September 6
Last day to ADD a class	Monday, September 19
Last day to file Graduation Petition for January Commencement	Friday, October 14
Thanksgiving Vacation Week	Monday-Saturday, November 21-26
Last day to submit application for the Winter trimester	Wednesday, November 23
Last day to file Financial Aid Application for Winter trimester	Thursday, December 1
Last week of classes	Tuesday-Monday, December 6-12
Registration for new students for the Winter trimester	Wednesday, December 14 4:30-7:30 p.m.
Winter trimester classes start	Monday, January 2, 1978
Last day to submit grades for students expecting to graduate in January Commencement	Monday, January 2
Last day to ADD a class	Friday, January 13
Commencement	Sunday, January 22
Washington's Birthday — Monday classes will meet Friday, February 24	Monday, February 20

Last day to submit application for the Spring trimester	Friday, February 24
Last day to file Financial Aid Application for Spring trimester	Monday, February 27
Last day to file Graduation Petition for June Commencement	Wednesday, March 1
Registration for new students for the Spring trimester	Friday, March 17 4:30-7:30 p.m.
Good Friday — Friday classes will meet Saturday, March 25	Friday, March 24
Last week of classes	Monday-Saturday, March 27-April 1
Spring trimester classes start	Monday, April 3
Last day to ADD a class	Friday, April 14
Last day to submit grades for students expecting to graduate in June Commencement	Monday, May 15
Memorial Day — Monday classes will meet Friday, June 2	Monday, May 29
Commencement	Sunday, June 4
Last week of classes	Monday-Saturday, June 26-July 1

GENERAL INFORMATION

History of the University

Founded in 1920 as a branch of Northeastern University run by the New Haven YMCA, the University of New Haven has grown from the small New Haven YMCA Junior College to a major, urban, coeducational, private university.

Until 1958, growth of the school was very slow, hampered by a lack of facilities. For nearly 40 years, classes met in space rented from Yale University. A new era began in 1958, when New Haven YMCA Junior College constructed a classroom building in New Haven, the first permanent home the college ever had.

The Connecticut legislature granted the college independence in 1959, and empowered the school to offer a four-year program leading to a bachelor's degree. Though the student body numbered fewer than 200, the facilities in downtown New Haven were becoming overcrowded. The Board of Governors of the college realized that, if the institution were to serve the area's educational demand and meet its full potential, new quarters had to be found. Their search took them a short distance west.

On a hill in West Haven, three buildings, once the New Haven County Orphanage, stood vacant. The Board of Governors made a successful bid for the property, and the future of the college was assured.

New Haven College introduced new programs for full-time stud-

ents, and courses in other credit and noncredit curricula. The combination of greatly increased classroom space and the four-year degree program sparked a period of tremendous growth in enrollment and facilities. In 1961, the year after the college moved to West Haven, the graduating class numbered 75. Fifteen years later, that figure had climbed to 1,000.

The acquisition of 28 acres of undeveloped land near the main campus in 1962 made possible the construction of playing fields, tennis courts and a new Physical Education-Auditorium Building. In October 1974, the Marvin K. Peterson Library on the Main Campus opened to students.

New Haven College received full accreditation of its baccalaureate programs from the New England Association of Schools and Colleges professionals with an understanding of important cultural and scientific effectively toward its principal objectives: to provide leaders and professionals with an understanding of impotant cultural and scientific progress, and to encourage students to reach their maximum potential.

In 1969, the college took a major step forward with the addition of the Graduate School. Initially offering programs in business administration and industrial engineering, the Graduate School expanded rapidly. Today, 14 programs and additional courses have pushed graduate enrollment to more than 1,500.

On the fiftieth anniversary of the founding of the college, in 1970, New Haven College became the University of New Haven, reflecting the increased scope and the diversity of academic programs offered. Originally founded to meet a single distinct need in the New Haven community, the institution now ranks as a major academic institution offering programs in more than 50 different areas of study. This wide range of studies provides a total educational experience for University of New Haven students.

Although most of the student body attend classes on the Main Campus in West Haven, the university has carried its academic programs to other Connecticut residents through off-campus centers. Several programs and numerous courses on the undergraduate and graduate levels are available at university branches around the state.

Planning for future growth at the University of New Haven centers around the Campaign for Excellence, a long-range development program designed to meet several university goals. The program includes plans for a University Center including classrooms for the arts and sciences and containing both an auditorium for the performing arts and a conference center. The Campaign for Excellence also calls for several endowments for scholarships and faculty chairs, monies for the modernization of physical facilities and campus extension and an endowment to expand library resources and improve laboratory facilities.

Philosophy of the University

The basic assumptions and goals which have governed and continue to govern the academic programs and life of the university are: the belief that there is value and virtue in a general education to help students acquire an understanding of society and the place of the individual within it; a conviction that the hallmark of an educated person is a critical mind in the sense of a capacity to test and challenge previous assumptions and new ideas; a strong commitment to the principle that in a complex and technological society a university cannot be insensitive to the need of its students for professional training which will enable them to obtain rewarding and productive employment; and that a higher education must provide students with a breadth of knowledge and a sensitivity to weigh ethical and moral issues and form values and life goals.

Other assumptions and considerations governing the academic programs and activities of the university have been: recognition of the need for students to participate in work and service activities which provide contacts with other aspects of society and in using skills and exercising judgment and responsibility in a variety of settings outside the university community; the importance of allowing full play and scope to the creative abilities and intellectual curiosity of students through opportunities to pursue independent study and investigation; the importance of recognizing the educational interests of students geared toward specific professions and careers as students seek to adjust to changing labor market conditions; and, lastly, preparing students for graduate and professional training beyond the baccalaureate.

Accreditation

The University of New Haven is a coeducational, nonsectarian, private institution of higher learning chartered by the General Assembly of the State of Connecticut and fully accredited by the Connecticut Commission for Higher Education. The university holds membership in the New England Association of Schools and Colleges, the American Council on Education, the Association of American Colleges, the National Association of Independent Colleges and Universities, the Connecticut Conference of Independent Colleges, the College Entrance Examination Board and is a member of other regional and national professional organizations.

The New England Association of Schools and Colleges accredits schools and colleges in the six New England states. Membership in one of the six regional accrediting associations in the United States indicates that the school or college has been carefully evaluated and found to meet standards agreed upon by qualified educators.

Affirmative Action

The University of New Haven is committed to a policy which provides for equality of opportunity in employment, advancement, admission and educational opportunity to all persons on the basis of individual merit.

The Affirmative Action Plan of the university serves as the document through which federal, state and local laws pertaining to fair employment, admission and educational programs are interpreted and carried out. Copies of the Affirmative Action Plan are available from the office of the Director of Equal Opportunity.

An Affirmative Action Review Board meets regularly to evaluate university policy and practice relevant to affirmative action.

TITLE IX

Title IX of the Education Amendments of 1972 states that, "no person in the United States shall on the basis of sex . . . be subject to discrimination under any educational program . . . receiving Federal financial assistance." Compliance with this act is administered through the Title IX Coordinator, and questions regarding Title IX's applicability to the university should be addressed to the Coordinator. A grievance procedure for student and employee complaints of discrimination is available.

Divisions of the University

The University of New Haven has three administrative divisions: the undergraduate schools, including the School of Arts and Sciences, the School of Business Administration, and the School of Engineering; the Division of Continuing Education; and the Graduate School. All divisions of the University are coeducational.

Undergraduate Programs

The three undergraduate schools offer programs leading to four-year baccalaureate degrees and two-year associate's degrees.

Students pursuing a course of study leading to a Bachelor of Science degree in the School of Business Administration may elect a major in business administration; business data processing; business economics; communication; criminal justice; finance; financial accounting; hotel management, tourism and travel; international business; management science; managerial accounting; operations management; marketing; personnel management; public administration; or retailing.

Students in the School of Engineering may choose programs leading to the following degrees: Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Industrial Engineering, Bachelor of Science in Computer Technology, Bachelor of Science in Mechanical Engineering, or the Bachelor of Science in Materials Engineering.

Students in a course of study leading to a Bachelor of Arts degree may elect a major in art, biology, chemistry, communication, economics, English, environmental studies, history, mathematics, world music, philosophy, physics, political science, psychology, sociology or social welfare. Bachelor of Science degree programs are available in biology, chemistry, fire science, occupational safety and health, or physics. A student may also pursue an interdisciplinary program leading to a Bachelor of Arts degree in either American studies or anthropology.

Associate in Science degree programs are offered in aeronautical technology; business administration; communication; criminal justice; engineering; hotel management, tourism and travel; and retailing.

In addition, students pursuing a course of study leading to an Associate in Science degree in the School of Arts and Sciences may choose a major in biology, chemistry, general studies, commercial and advertising art, occupational safety and health, or journalism.

DOUBLE MAJORS

A minor or an associate degree may be taken in a department other than that of the student's major concurrent with the pursuit of the major program. A full double major may be taken by fulfilling all the core requirements for each major. This includes the core requirements of each division and each department involved. A double major shall not be construed to be a double degree.

PREPROFESSIONAL PROGRAMS

In addition to the traditional professions such as law, medicine, public service and the ministry, more and more vocations require that students continue their training after earning the bachelor's degree. Students who wish to begin training for a profession at the graduate level should write to the university they expect to attend and ask for a statement of the entrance requirements.

Prescribed programs in the student's major area will be modified to meet requirements for entrance into professional programs or to meet the special needs of individual students. Such programs must be approved in writing by the appropriate department chairman and dean.

Division of Continuing Education

This division of the university has six distinct programs. The largest is the Evening College which offers a wide variety of undergraduate credit programs.

The others are: Summer School, which offers undergraduate courses in two, five-week terms to students wishing to accelerate their academic careers or to make up courses uncompleted during the previous year; the off-campus program offered at various locations throughout the state; Intersession, which offers credit courses during the period between the fall and spring semesters; the Division of Special Studies, which offers a variety of noncredit, certificate courses in both specialized and general areas of study; and the Management Center, which provides specialized training to managers and administrators in business and industry.

EVENING COLLEGE

The University of New Haven recognizes that not every student can afford the time or expense of a full-time education. The Evening

College was established to serve those students seeking to widen their academic horizons while still pursuing a career. The Evening College staff is dedicated to guiding students into programs that best suit their strengths and career needs.

The university believes that work is a vital life experience, one which can be enhanced by academic study. To enrich this experience, a student's work should, if possible, be closely related to a chosen course of study.

The Evening College offers programs leading to the Bachelor of Science, Bachelor of Arts or Associate in Science degrees. Most courses offered by the Evening College, except laboratory and certain four-hour courses, meet from 7 to 9:45 p.m., one night a week. The university is open Monday through Saturday.

A student may carry as few as two semester hours or as many as eleven.

SUMMER SCHOOL

Undergraduate courses are offered during the summer by the university in two, five-week terms. Both day and evening courses are offered.

The university welcomes students from other institutions who wish to make up courses or earn advanced standing at their parent schools. Credits earned at the University of New Haven are generally acceptable to other schools, but, for the protection of the student, a letter of authorization from the parent school is required before enrollment is permitted.

University of New Haven students can attend Summer School to lighten their study load during the regular academic year, to reduce the time required for a degree, to prepare for other courses, to make up courses or to take additional work beyond that required for a degree and still complete a program on schedule.

A list of the courses offered during the summer is available from the Division of Continuing Education each spring.

OFF-CAMPUS PROGRAM

The University of New Haven has sought to fill the educational demands of not only the New Haven area, but also of the region through undergraduate and graduate programs in various off-campus locations around the state.

One of the most unusual programs is the University of New Haven at New London. It offers the only upper-level degree programs in business administration and engineering in southeastern Connecticut, and a four-year degree program in criminal justice. Taught by regular

University of New Haven faculty, both day and evening courses are available.

In addition, the Graduate School offers programs in Groton/New London, Danbury, Middlebury, Waterbury and Middletown.

INTERSESSION

A number of undergraduate courses are offered during the break between the fall and spring semesters. These courses blend both traditional and innovative methods of instruction, including team teaching, field trips, lectures, laboratory work and research projects. A listing of courses offered during Intersession will be available from the Division of Continuing Education in November.

DIVISION OF SPECIAL STUDIES

This division offers a series of professional certificate courses in engineering, business and general areas. Courses are usually designed to provide supplemental knowledge and skills needed in specialized jobs in business and industry, and do not carry academic credit. Further information may be obtained by requesting separate schedules and course folders from the director of the Division of Special Studies. A certificate is granted upon successful course completion. Inquiries are invited concerning the availability of special in-plant programs.

MANAGEMENT CENTER

The purpose of the Management Center is to provide educational opportunities for those managers and administrators in industry, business, and service organizations whose needs are not met in more conventional undergraduate or graduate programs. The overall objective of the center is to offer programs to help managers of maturity and experience meet the broader and more complex requirements of positions of greater responsibility in their organizations.

Broadly speaking, the programs of the center are designed to meet the needs of two different levels of management: staff and line executives at upper levels, and middle management administrators. At the upper executive level, the programs consist of seminars and workshops of varying lengths as needed. At the middle management level, the standard format is a part-time, on-campus program. In-plant programs are offered which meet the specific needs of an individual company or industry. Special programs are available on an ad hoc basis, either on or off campus, as required.

Graduate School

Since it began in the fall of 1969, the Graduate School has offered quality education leading to degrees that are keyed to job enhancement and professional development. The Graduate School schedules its programs and courses to meet the needs of working professionals. Courses are offered in the early evening on the West Haven campus, as well as at off-campus locations in Groton, Danbury, Middlebury, Waterbury and Middletown.

The Graduate School operates on a trimester calendar with three, 13-week terms and a short summer term. This provides scheduling flexibility for students who are employed and enables students to complete their studies within a reasonable length of time. The student body tends to be heterogeneous in background, age and work experience, providing an additional dimension to the learning experience.

Those wishing additional information about the Graduate School or any of its programs should write to the Graduate School office to request a copy of the Graduate School bulletin.

Undergraduate Admissions

Day Division

ADMISSION REQUIREMENTS

Each school of the university has its own admission requirements which are defined in detail in subsequent pages of this bulletin.

In general, all applicants must have graduated from an accredited secondary school or have passed the state high-school equivalency examination to be considered for admission. The University of New Haven welcomes applications from men and women from all geographic areas, from public or private schools and from all races, economic levels and religions.

With the exception of auditors, students wishing to take any course, whether or not they seek a degree, must first satisfy the admission requirements.

ADVANCED PLACEMENT

The university recognizes the program of advanced placement available to talented high school students operated by the College Entrance Examination Board. Students satisfactorily completing advanced placement courses in high school and the final examination prepared by the Educational Testing Service (E.T.S.) may be given appropriate college credit if their courses are similar to those offered at the University of New Haven.

E.T.S. Advanced Placement examinations are graded from 1 to 5. Credit is allowed where the grade earned is 3, 4 or 5. Credit may be given for a grade of 2 if a careful review of the test by this university determines acceptability. No credit will be allowed for a grade of 1. Students desiring to submit advanced placement courses for college credit should have all results of these courses and tests sent in with their application to the Admissions Office.

The University of New Haven accepts credit by examination from the College Level Examination Program (CLEP). The passing percentile for CLEP and subject examinations is 50. Credit will be evaluated by department chairmen.

CREDITING EXAMINATIONS

A student who has independent knowledge of the content of an undergraduate course offered by the university may, with the approval of the respective department chairman and dean, take a special crediting examination in lieu of taking the course.

Students are encouraged to take crediting examinations if they profess a proficiency in a subject area. Students are reminded that they must earn at least 30 semester hours through regular course work if they are to meet the residency requirement for graduation.

No student may take crediting examinations during the first and last semester in which he is enrolled.

DEVELOPMENTAL STUDIES

For students who appear to have the potential for success in college but have a weak high school record, admittance may be made through Developmental Studies. Applicants who are temporarily assigned to Developmental Studies are full-time matriculated students. Such students are required to take a series of four coordinated courses which are designed to strengthen their foundation in basic skills and to prepare them for the more demanding, upper-level courses.

ADMISSION PROCEDURE

1. Write or telephone the university for information or to arrange for an interview. Telephone (area code 203) 934-6321, ext. 211 or 212.
2. Secure an application form from the Admissions Office of the university or from your high school guidance counselor.
3. Submit the completed application form with a $15 application fee. This fee is not refundable.
4. Request your secondary school and/or college to forward an official copy of your academic transcript directly to the Admissions Office. Work in progress at the time the initial transcripts are requested may also be submitted, and students are encouraged to do so. Applicants who have work in progress are responsible for submitting supplementary records as they become available.
5. Arrange for results of Scholastic Aptitude Tests (S.A.T.) or American College Testing Program (A.C.T.) examinations to be sent directly to the Admissions Office, or arrange to take the University of New Haven tests.

REGISTRATION

There are two parts to registration: the completion of the registration forms and the payment of tuition. There is a penalty fee for delaying either of these two processes beyond the end of the registration period.

Registration dates and procedures for currently enrolled day students will be posted in advance. New students will receive registration procedures by mail. New students must register in person. A separate registration is required for each of the semesters and for summer sessions.

Social Security numbers will be used on student records; students should be sure to bring their number when registering. Prospective students who do not have a Social Security number should apply for one before registration. Students from other countries who do not have Social Security numbers will be given a temporary number by the university; however, they will be encouraged to apply for a Social Security number as soon as possible.

Day students may register for no more than three evening courses. Any waiver of this regulation must be obtained from the appropriate dean.

Students are urged to plan their programs carefully before completing the registration forms in order to avoid the need for requesting changes. Once the registration is completed, students are charged the Change of Registration Fee for each change made. The fee is payable upon completion of the form requesting the change.

Please Note. No student will be permitted to register for classes until:

1. The fifty dollar acceptance fee has been paid.
2. Tuition **in full** for the semester has been received. If a student is relying on financial aid, evidence of the amount of money awarded must be presented.

All students pay the tuition charged by the division in which they are matriculated. Courses taken outside the division of matriculation incur the tuition charge of the division of matriculation, irrespective of tuition differences among divisions.

Division of Continuing Education

ADMISSION REQUIREMENTS

The University of New Haven welcomes applications from men and women from all geographic areas, public and private schools and all races, economic levels and religions.

Generally, graduates of accredited secondary schools or persons who have a state high school equivalency diploma are eligible for admission.

Information regarding the examination for the state high school equivalency diploma may be obtained from the Director of Admissions or by writing to the Bureau of Youth Services, State Department of Education, State Office Building, Hartford, Connecticut 06103.

In some cases, an adult who has completed at least two years of secondary school with a satisfactory record may be considered, provided he or she performs exceptionally well on the required placement examinations. In the case of adults, the university is interested in evidence of maturity and motivation as well as in formal education as prerequisites for admission. Such an admission will be tentative for one year, and during that time the student must pass the examinations for the state high school equivalency diploma. A person who has not completed at least two years of secondary school will not be considered.

With the exception of auditors, students taking any course, whether for a degree or not, must meet admission requirements.

Applicants from secondary schools are required to take admission tests, including scholastic aptitude, mechanics of English and reading comprehension. College Entrance Examination Board results, if satisfactory, are accepted in place of the University of New Haven admission requirements.

ADMISSION PROCEDURE

Persons seeking admission should call or write the Division of

Continuing Education to arrange a personal interview. During the interview, the applicant will complete a personal data form and plan his program. Interviews may be scheduled during office hours at the convenience of the applicant.

When the applicant decides to seek admission, an application fee must be paid. The university then requests the secondary school record of the applicant. Those applicants who have attended other colleges or universities must present transcripts from those institutions, whether applying for admission or applying for advanced standing. The student must arrange this individually, and by using a form which is available for this purpose.

REGISTRATION

All new students must register in person at the Office of Continuing Education. Currently enrolled students may register by mail and forms will be mailed to each student prior to registration dates. A separate registration is required for each of the semesters and for summer sessions.

There are two parts to registration: the completion of the registration forms and the payment of tuition. There is a penalty fee for delaying either of these two processes beyond the end of the registration period.

Auditors follow the same procedure and pay the same fees as credit students.

Students are urged to plan their programs carefully before completing registration forms to avoid the need for changes. Once the registration period has ended, the Change of Registration fee is charged for each change made, payable when the form requesting the change is completed.

Scholastic Regulations

Classification of Students

Full-time students must complete a minimum of 12 credits per semester to retain their status as full-time students. Completion is defined as receipt of a letter grade of **A, B, C, D** or **F.**

In order to be classified as a member of any class except the freshman class, a student must successfully complete the following numbers of semester hours in an approved program: sophomore, 27 semester hours; junior, 57 semester hours; and senior, 87 semester hours.

Attendance Regulations

Every student is expected to attend all regularly scheduled classes. This is a major responsibility of the student to himself and to the university. The primary penalty for nonattendance lies in the student's lessened grasp of the subject matter of the course.

From time to time, it may become necessary for the university to compile attendance records for every course in order to meet the needs of regulatory agencies and accrediting bodies.

A maximum of two weeks of absences (that is, two absences per semester for an evening student, six absences per semester for a day student meeting a class three times a week, four if the class mets twice weekly) will be permitted for illnesses and emergencies. If the student is absent more than the maximum allowed, he will be dismissed from the class unless he obtains permission from the instructor to continue. Please refer to the **Student Handbook** for further clarification of attendance requirements.

Grading System

The following grading system is in use and, except where otherwise specified, applies both to examinations and to term work. The weight of a final examination grade is a matter individually determined by each instructor.

A Superior
B Good
C Fair
D Lowest passing grade
F Failure or withdrawal after midpoint with unsatisfactory work
I Incomplete

1. The grade of **I** indicates that some work remains to be completed to gain academic credit for a course. An **I** is assigned at the discretion of the instructor. This assignment shall not be automatic, but shall be based upon an evaluation of the student's work completed to date and an assessment of the student's ability to complete course requirements within the allowed time limit.
2. Work to remove an **I** must be performed within the twelve

(12) months following the last day of the semester in which an **I** is incurred.

3. When such work is completed, the instructor will assign a final grade for the course.
4. Should the student fail to complete unfulfilled academic assignments within twelve (12) months, the grade of **W** will be entered on the student's record. This grade will be final; no further opportunity to complete the course will be available to a student after this time.

W Withdrawal. Indicates either (1) withdrawal prior to the midpoint of semester, or (2) withdrawal after the midpoint of semester and work satisfactory at that time.

S Satisfactory. Given only in noncredit courses.

U Unsatisfactory. Given only in noncredit courses.

Grade Reports

Reports of the final grade in each subject will be mailed to the student soon after the close of each semester. The same report will be mailed to employers in those instances in which the student has given approval.

Academic Standards

The academic standing of each student is determined on the basis of the quality point ratio earned each semester.

To determine a quality point ratio, each letter grade earned during a semester is assigned a quality point value:

A—four quality points
B—three quality points
C—two quality points
D—one quality point
F—zero quality points
I—zero quality points
W—zero quality points
S—zero quality points
U—zero quality points

The quality point ratio is obtained by multiplying the quality point value of each grade by the number of semester hours assigned to each course in the bulletin, then dividing the total quality points earned by the total semester hours attempted.

A cumulative quality point ratio is obtained by calculating the quality point ratio for all courses attempted at the University of New

Haven. Students are required to maintain a minimum cumulative quality point ratio in accordance with the following scale:

Quality point ratio of 1.50 for 3 to 30 semester hours attempted
Quality point ratio of 1.60 for 31 to 45 semester hours attempted
Quality point ratio of 1.70 for 46 to 60 semester hours attempted
Quality point ratio of 1.80 for 61 to 75 semester hours attempted
Quality point ratio of 1.90 for 76 to 90 semester hours attempted
Quality point ratio of 2.00 for 91 or more semester hours attempted

Dean's List

Full-time students who earn a quality point ratio of 3.20 or better in any one semester will be placed on the Dean's List.

All part-time students who have accumulated a minimum of 14 semester hours at the university will automatically be considered for the Dean's List at the end of each semester. A cumulative quality point ratio of 3.20 or better is required.

Repetition of Work

A course in which a student has received a grade of **F** or above may be repeated only with the consent of the chairman of the department in which the course is listed. If a student achieves a higher grade in the second attempt, the cumulative average will reflect the achievement. However, both the higher and the lower grades in the course remain in the student's permanent record.

Probation and Dismissal

Failure to earn the required minimum cumulative quality point ratio will place a student on academic probation for the following semester of enrollment. A student is automatically dismissed when he receives a third probation or when his quality point ratio for any one semester is less than 1.00.

First-semester freshmen earning a quality point ratio less than 1.00 are automatically referred to the Academic Standing and Admissions Committee which may specify conditions for continued enrollment. A record of committee action shall appear on the student's permanent record. Committee decisions are normally viewed as final, and may be reversed only by the provost or president of the university.

Academic probation of transfer students is determined in accordance with the same, graduated, minimum cumulative quality point ratio

scale as for nontransfer students. In determining whether a transfer student will be placed on probation, the student's total semester hours completed—those received at another college plus those received at the University of New Haven—are applied to the minimum cumulative quality point ratio scale. However, only the cumulative average earned at the University of New Haven is considered in determining a student's academic standing.

Appeal of Dismissal

Should a student wish to appeal academic dismissal, the student must contact his department chairman; or, if the chairman is unavailable, the student must contact his dean. The student must request, in writing, that the chairman or dean recommend reconsideration of the dismissal. The student must also write the Director of Admissions and ask that the Academic Standing and Admissions Committee review the dismissal. The Academic Standing and Admissions Committee will review the appeal and make a decision. If the appeal is denied, the student is dismissed and is not billed for the semester during which he was dismissed. The student may reapply after one semester.

Readmission

Application for readmission after a student has been dismissed normally will be considered only after the lapse of a semester and only when the student provides evidence which indicates his probable success if readmitted.

Unusual circumstances may permit earlier application if the student's dean and department chairman successfully petition the Academic Standing and Admissions Committee to review the applicant's case.

Requests for readmission should be submitted in writing to the Director of Admissions for transfer to the chairman of the Academic Standing and Admissions Committee at least three weeks before the opening of the semester, and should include evidence supporting the student's belief that he will succeed if readmitted.

Readmission is not automatic. The Academic Standing and Admissions Committee reviews each application and recommends rejection, acceptance or conditional acceptance to the Director of Admissions.

Special Course Work and Schedules

For students with particular needs and interests, certain departments at the university offer the opportunity for an interdisciplinary major. The student may plan a program in two or more major departments. In such cases, the dean will appoint a faculty member from each department to plan with the student a sequence of courses which most nearly satisfies his interests.

The program will generally consist of existing courses and independent study. A minimum of 51 credits in the area of interest must be completed to satisfy the requirements for graduation. The program must be approved by the department chairman and forwarded to the Registrar to be filed in the student's folder.

A student may not register for more than 15 semester hours in any one semester without written permission from his advisor and approval of his department chairman unless the student's work sheet specifically requires him to take more hours. In the latter case, the student is limited to the number of hours specified on his work sheet.

In most instances, a student will be required to achieve a cumulative quality point ratio of 3.20 in order to register for more than 15 semester hours in any one semester. This policy applies to all students entering the University of New Haven after September 1, 1976.

Independent Study

In all courses of independent study, including internships, case studies, reading programs, practica, theses and work-study experiences, the student and an advisor must jointly file a project outline with the Registrar within four weeks of the beginning of the course. This outline shall serve as the basis for determining satisfactory completion of course requirements. In the case of intensive or condensed coursework, project outlines must be filed at least one week prior to the last day of the session.

Advanced Study

Advanced study courses are offered for qualified students in the departments offering the degree of Bachelor of Science or Bachelor of Arts. These courses may include a thesis, tutorial work or independent study which permits the student to work intensively in areas of special interest.

Courses Available at Other Colleges

The University of New Haven has established policies to allow its students to take courses at Southern Connecticut State College, Albertus Magnus College and Quinnipiac College. University of New Haven students interested in taking courses at other colleges and universities in the New Haven area should discuss this matter directly with the deans and consult the statement of policy established by the undergraduate schools.

Transfer of Credit to the University

Students may transfer to the university after completing academic work at other institutions. Application for admission should be made to the Director of Admissions. If feasible, a potential transfer student should visit the university and discuss his or her transfer credit situation with the chairman or dean administering the curriculum of interest. Transfer credit may be affected by the level of accreditation of the institutions previously attended. Normally, the university accepts credit from regionally or nationally accredited colleges on an equivalency basis.

The residency requirement of the university is 30 credit hours taken at West Haven or at one of the university's off-campus centers. This requirement applies to all degrees, undergraduate and graduate. and must be satisfied in the five years preceding graduation.

Students transferring from another institution must possess at least a 2.00 quality point ratio. Credit is normally granted only for those courses completed with a grade of **C**, or its equivalent, or better. Credit transferred from a two-year institution is generally limited to 60 credit hours, unless otherwise approved in writing by the dean of the school in which the student seeks to enroll.

Final decisions on transfer credit are made by department chairmen and must conform to policies unique to the school. Specific programs may require that a potential student take qualifying or placement examinations.

Plans of study for a University of New Haven degree should be agreed upon by both the transfer student and the department early in the first term of attendance in order to avoid course duplication and academic discontinuity. To insure depth of study, the residency requirement must include 12 credit hours of work in the declared major for an associate degree, and 18 credit hours for a bachelor's degree. Exceptions may be granted only by the dean administering the major.

Transfer of Credit from the University

Credits may be transferred from the University of New Haven, a fully accredited university, to any other college or university merely by obtaining a letter of authorization from the school regularly attended.

Degrees

The baccalaureate or associate degree will be conferred at commencement when the student has met all the requirements of his program and has met the following university requirements:

1. has submitted a paid Graduation Intent form to the Registrar;
2. has earned a cumulative quality point ratio of at least 2.00;
3. has been recommended by the faculty;
4. has met all financial obligations;
5. has met the residency requirement of the university.

Honors

Honors may be conferred upon candidates for graduation who have completed at least 60 semester hours of work at the University of New Haven. Application of transfer credit often carries over into the junior and senior years for four-year transfer students. The following standards shall be used:

1. An associate degree **With Honors** is awarded to students who have a quality point ratio of 3.25 for the semester hours specifically required for the degree program from which they are being graduated, and who have taken 30 or more hours of required work at this university.
2. An associate degree **With High Honors** is awarded to students who have a quality point ratio of 3.50 for the semester hours specifically required for the degree program from which they are being graduated, and who have taken 30 or more hours of required work at this university.
3. The bachelor's degree **Cum Laude** may be awarded to a student whose cumulative quality point ratio is at least 3.25 at the end of the first semester of his senior year, and who continues to attain the same standard for the remainder of the year.
4. The bachelor's degree **Magna Cum Laude** may be awarded to

a student whose cumulative quality point ratio is at least 3.50 at the end of the first semester of his senior year, who continues to attain the same standard for the remainder of the year, whose quality point ratio in all courses counting toward his major is at least 3.50, and who has completed all the suggested courses within his curriculum.

5. The bachelor's degree **Summa Cum Laude** may be awarded to a student whose cumulative quality point ratio is at least 3.70 at the end of the first semester of his senior year, who continues to attain the same standard for the remainder of the year, whose quality point ratio in all courses counting toward his major is at least 3.70, and who has completed all the suggested courses within his curriculum.

In determining eligibility for degrees with honor, credits earned by crediting examinations and electives in excess of those required will not be considered.

Tuition, Fees, and Expenses

All students pay the tuition charged by the division in which they are matriculated. Courses taken outside the division of matriculation incur the tuition charge of the division of matriculation, irrespective of tuition differences between divisions. For example, a student matriculated in the Evening College but taking a daytime course would pay the cost of tuition for that course at the per-credit cost charged in the Evening College, not the daytime cost.

Undergraduate Day Division, regular academic year, 1977-78

For undergraduate students enrolled in the Day Division

Application Fee $15
Payable once at the time of initial application.

Acceptance Fee $50
Payable by all new students (incoming freshmen, transfer and former students) upon notification of acceptance, not refundable.

Tuition, 1977-78	**Per Semester**	**Per Year**
Full time students, 12 to 18 hours or equivalent	$1286	$2572
Less than 12 credit hours, day division, per credit hour	$85.75	
More than 18 credit hours, or equivalent, per credit hour	$60.00	
***Student Activity Fee**	$ 35	$ 70
Total standard tuition and fees for regular full-time undergraduate students for 1976-77 academic year	$1321	$2642

Note: The Student Activity Fee is distributed by the Day Student Government and covers the cost of student supported services such as the newspaper and radio station and helps defray the expenses of clubs, organizations, social activities and the football and lacrosse teams.

Registration Late Fee $15
Assessed for failure to complete registration at the designated time.

Tuition Late Fee $5
Assessed for failure to complete tuition payment by the due date: an additional fee for nonpayment of $5.00 at the start of the semester, plus $1.00 per day for each day thereafter, up to a maximum of $30.

*Student activity fee quoted here was in effect for the 1976-77 academic year. At the time of printing of this bulletin, the fee for 1977-78 had not yet been established.

Undergraduate Evening College, regular academic year, 1977-78
For undergraduate students enrolled in the Evening College.

Application Fee $10
Payable once at the initial time of application. Not refundable.

Tuition, 1977-78
Part time students, up to 12 credit hours, per credit hour $60

Note: The Evening College tuition includes the Student Activity Fee which covers subscription to the university newspaper, use of the Student Center, and helps to defray the cost of all student activities and facilities.

Tuition Late Fee $10
Evening Division tuition is due at the rate of 50 percent at the time of registration, with the balance due the first day of the semester. The tuition late fee is assessed for failure to complete tuition payment by the beginning of the second full week of the semester.

Change of Registration Fee $5
Assessed for changing courses or sections after the completion of registration.

Other Fees

Applicable to all undergraduate students enrolled in the university.

LABORATORY FEES

Payable each semester by students registering for courses requiring the laboratory fee as listed in the bulletin. Nonrefundable fees range from $10 to $25, and are announced in printed course schedules in advance of each semester.

MAKE-UP EXAMINATION

Assessed when a student is permitted to take an end-of-semester examination at a time other than the scheduled time, except for conflicts caused by the examination schedule $5

MAKE-UP TEST

Assessed when a student is permitted to make up an announced test during the semester $3

AUDITORS

The fee for a student auditor in any course or courses is the same as if the courses were taken for credit.

GRADUATION FEE

Assessed regardless of participation in exercises; no reduction will be made for non-attendance. For graduation in June, the fee and graduation petition are due no later than March 1 of the year of graduation; for January commencement, the fee and graduation petition are due before October 15 of the prior calendar year. Failure to meet the deadline date will result in a charge of $25 above the normal graduation fee. This fee will be paid if there is sufficient time to process the graduation petition. If processing is not possible, graduation will be postponed to the next award date $35

TRANSCRIPT OF ACADEMIC WORK

No charge for the first copy; thereafter, per copy $1

Residence Charges

Dormitory rooms are contracted for the entire academic year excluding Intersession courses. The Residence will officially be closed during Thanksgiving, Christmas and Spring vacation periods when classes are not in session.

A dormitory deposit is required of all students who will be living in the Residence, and this deposit will be deducted from the spring semester room charge. The room deposit is not refundable after July 31 of the year to which it pertains.

Living Expenses

The university assumes no responsibility for loss or destruction of any clothing or personal belongings of the student. An optional linen plan is available for those students who desire it.

Room Deposit	$100
*Room Charge per year, 1976-77	$830
Damage Deposit, refundable	$ 50
*20 Meal Plan (Monday through Saturday, 3 meals per day, Sunday brunch and dinner) per year, 1976-77	$705
*15 Meal Plan (Monday through Friday, 3 meals per day) per year, 1976-77	$650

Payments

Tuition, fees and other charges are payable when due. Checks or money orders should be made payable to University of New Haven.

As a convenience to those who desire to spread their payments out over the period of a semester, a deferred payment bank loan plan is available to full-time students and to part-time students carrying six or more credits or the equivalent. Details and forms for this plan are available at the business office.

Application for this plan must be made prior to the first day of each semester.

The university withholds the giving of grades, the issuance of transcripts and the granting of honorable dismissal to any student whose account is in arrears.

Withdrawal

FROM THE UNIVERSITY

Students are required to discuss their intentions with a member of the Counseling Center before officially withdrawing from the university. Forms for withdrawal are available at the Counseling Center.

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*Room charge and meal plan costs quoted here are those in effect for the 1976-77 academic year. At the time of printing of this bulletin, room charge and meal plan costs for 1977-78 had not yet been established by the university's Board of Governors.

FROM A PROGRAM

Students considering a change in program should first discuss the matter with the department chairman of the proposed new program. If it is agreed that the change is advisable, written permission will be granted. Forms for making a change are provided by the Reception Office.

COURSE CHANGES

Forms are available at the student records office.

Registration does not carry with it the right of an automatic refund of tuition in cases of withdrawal. No deduction is made for temporary absence from classes, nor is any refund made if a student is suspended or dismissed.

Refund of Tuition

1. Any student under the age of 18 must have the written consent of a parent or guardian to withdraw from the university with an indication to whom any refund, if applicable, is to be paid.
2. Tuition is refunded or canceled according to the scale below upon receipt of formal withdrawal request before the end of the fourth week of a semester.

1st Week — 80%
2nd Week — 60%
3rd Week — 40%
4th Week — 20%
After 4th Week — 0%

A prorated credit toward the following semester or refund may be awarded, subject to the decision of the Committee on Withdrawals, in situations involving:

(a) death or protracted illness of a student;
(b) involuntary induction into military service;
(c) other clearly extenuating circumstances;
(d) in the case of part-time students, transfer or change of work initiated by employer that precludes meeting class schedules.

All requests for refund must be made in writing and include necessary documentation. The university assumes no responsibility beyond the foregoing for withdrawal occasioned by the pressures of family life or occupation.

SUMMER SCHOOL STUDENTS

In cases of withdrawal from a course or courses within the first week of each term, a refund of 50% of tuition is made. There is no refund of summer tuition after the first week.

The foregoing policy is intended to protect the university, since the university plans its expenses and bases its budget upon full collection of tuition and fees from all registered students, and assumes the obligation of supplying instruction and other services throughout the year.

Changes in Arrangements

The university reserves the right, at any time, to make whatever changes may be deemed necessary in admission requirements, fees, charges, tuition, regulations and academic programs prior to the start of any class, term, semester, trimester or session.

Financial Aid

More than half of the students at the university receive financial assistance annually in the form of scholarships, grants, loans, bursary work and the College Work-Study Program. Applications should be made by returning students no later than April 1 for the following year, and by new students before May 1.

Usually, financial aid is not available for the summer term or at midyear. Ordinarily, students needing assistance will seek employment during the summer to help defray their expenses for the following year.

Full information and applications for financial aid may be obtained from the Director of Financial Aid.

Scholarships & Awards

ACADEMIC SCHOLARSHIPS

A number of scholarships are awarded each year on the basis of academic achievement, financial need, evidence of self-help and overall contribution to the university. To be eligible, a student must have a cumulative quality point ratio of 3.2 or better, and must show evidence of financial need.

DONOR SCHOLARSHIPS

Many scholarship awards are available each year through the generosity of business firms, organizations and friends of the university.

Alumni Scholarship—An annual award of $1,000 is designated for the son or daughter of one of the alumni of the university. Selection will be made by the Student Aid Committee after a review of applicants. This award is given on a one-year basis and is not renewable.

Amity Charitable Trust Fund—An annual award is made from the income of this fund to worthy students, based on ability, promise and financial need without regard to sex, race, country of national origin or religion. Preference is given to students whose homes are in the greater New Haven area.

Asarco-Enthone Scholarship—An award of $1,000 is given annually to a student in the field of chemistry. The recipient must be a citizen of the United States or Canada and be in good health. Selection is based on

activities as well as scholarship.

Carmel Benevento Memorial Scholarship—This scholarship is awarded annually to a woman entering the university as a freshman. The award was established in memory of Carmel Benevento. Selection is based on need and outstanding academic or creative ability.

Clarence W. Dunham Scholarship—An annual award of $500 is made to a civil engineering student after completion of the freshman year. Applicants must be recommended by the Dean of Engineering and the Chairman of Civil Engineering.

Chesebrough-Pond's Inc. Engineering Scholarships—These scholarships are designated for students in the field of engineering. Preference is given to U.S. citizens and minority students. High academic ability and promise are prime considerations.

H.B. Ives Company Scholarship Foundation—An annual award of $500 is made to a male undergraduate seeking a degree in engineering, business administration or management. The recipient must be a resident of New Haven County.

H. H. Brown Shoe Company, Inc.—This scholarship is offered on an annual basis to a junior or senior in Business Administration or Economics. Academic record and financial need will be considered in selection of the recipient.

Paul Kane Memorial Scholarship—Award is made annually to a scholar-athlete in memory of Lt. Paul Kane, U.S.N., a former student at the University and captain of the hockey team. Lt. Kane, a pilot in the U.S. Navy, was killed in a crash in the Pacific Ocean in 1974.

The Martin Luther King Jr. Memorial Scholarship Fund—Annual awards are available to students entering the University of New Haven who exemplify the ideals of the late Dr. Martin Luther King Jr.

Milford Rotary Club Scholarship—The recipient of this annual scholarship of $1,000 is selected after a review of candidates entering the university from Milford, Connecticut, and upon approval of the Rotary Club Scholarship Committee.

National Association of Accountants, New Haven Chapter—A scholarship is awarded annually to an accounting student entering second-year studies. Selection is restricted to students living in the greater New Haven area, and is based on academic record and need.

National Institute for the Food Service Industry—The Golden Plate and Heinz Scholarships are available to outstanding students in the Department of Hotel, Restaurant and Institutional Management, based on need and ability.

National Fund for Minority Engineering Students—Scholarships are offered to minority students entering a Bachelor of Science degree program in engineering. The number of awards is dependent upon

enrollment of eligible students, and amounts range up to $2,000. Selection is based on need and demonstrated academic ability to succeed in this field of study.

New Haven Water Company—An annual scholarship is awarded to a student from the inner city of New Haven. Selection is made on the basis of financial need and potential for academic success in a college program.

Rotary Club International Scholarship—A scholarship of $1,000 for one year is offered to an international student sponsored by a Rotary Club in the greater New Haven area.

Southern Connecticut Gas Company Scholarship—A scholarship of one-half year's tuition is sponsored by the Southern Connecticut Gas Company. This award is made annually to an inner-city resident of New Haven meeting need and academic qualifications.

Southern New England Telephone Company Aid to Scholars—Annual awards are made available to entering freshmen from Connecticut through this scholarship program. Selection for this assistance is based on financial need and academic record.

Statler Foundation—The foundation makes annual awards to deserving students in the Department of Hotel Management, Tourism and Travel.

The Olin Employees Fund—Full tuition scholarships are offered to sons and daughters of Olin employees meeting the standards of selection.

Virginia M. Parker Scholarship—Established by Chi Kappa Rho Sorority, it is awarded annually to a freshman woman selected on the basis of scholarship, potential and financial need.

Wallace Silversmiths Division of HMW Industries—A $1,500 annual scholarship award is available to a financially disadvantaged minority student majoring in business administration.

Women's Seamen's Friend Society of Connecticut—Assistance is offered to sons and daughters of merchant seamen of Connecticut and to students preparing for careers in the maritime industry.

Yale University—The scholarship plan for children of faculty and staff members of Yale University provides scholarship grants to qualified students.

Other scholarships of a restricted nature are also available to qualified students.

Annual prizes include the Freshman English Prize and the Nordlund Cup, which is awarded to an outstanding business major.

Grants

The University of New Haven awards grants to students who have demonstrated academic promise and financial need, and who have contributed to some area of university activity.

Special consideration is given to Connecticut residents with financial need through funds made available to the university by action of the General Assembly of the State of Connecticut in order to assist state students attending private colleges within Connecticut. In previous years, more than 600 grants have been made under these provisions averaging more than $700 apiece.

Two Federal grant programs are also open to University of New Haven students:

Basic Educational Opportunity Grants (B.E.O.G.)—Designed to assist needy students entering postsecondary education. Students apply directly to the B.E.O.G. program offices; information and application forms are available at high school guidance offices or at the university financial aid office. All university financial aid applicants are required to apply for a B.E.O.G. grant as a part of their university aid application. Awards under the B.E.O.G. program are presently authorized to a maximum of $1,400.

Supplemental Educational Opportunity Grants (S.E.O.G.)—Designed to assist needy students after consideration of other aid available. Awards of $200 to $1,500 may be made annually under this program to students in good standing who are making satisfactory progress toward graduation. These grants are supplemented by the university with other forms of aid available.

Many students at the university receive scholarships and grants from various state programs, including Connecticut, Pennsylvania and Massachusetts. There are many other organizations and companies offering scholarships and grants. Entering students should explore such opportunities for assistance with the guidance offices of the schools they are currently attending.

Loans

National Direct Student Loans—This program was established by the Higher Education Amendments of 1972 replacing the former National Defense Student Loan Program. Funds are available for loans of up to $1,000 annually to needy students with satisfactory academic records. Loans are repayable starting nine months after graduation at three percent simple interest.

United Student Aid Fund—This private, nonprofit service corporation provides long-term, low-interest loans to upperclassmen in good standing. Guaranty funds were provided by a donation of the Day Student Government so that the university could participate.

Guaranteed Loan Programs—The State of Connecticut and many other states have established higher education loan programs offering long-term loans at low interest rates. In Connecticut, a student may borrow up to a maximum of $1,500 each school year, repayable starting one year after graduation. Federal interest benefits may cover full interest while in attendance if criteria are met.

Institute of Electrical and Electronic Engineers—The Connecticut Section of the Institute of Electrical and Electronic Engineers Student Loan Fund offers non-interest-bearing loans to senior students in electrical engineering.

Additional Loans—Loan assistance to students in temporary financial difficulty is available through the Roy M. Jenkins Jr. Memorial Fund and The C. L. Robertson Emergency Loan Fund. Both of these are administered by the Financial Aid Office.

Law Enforcement Assistance Programs

Law Enforcement Student Loan program—Established under the Omnibus Crime Control and Safe Streets Act of 1968, the program makes available ten-year, interest-bearing (7%) notes of up to $2,200 per academic year to full-time students enrolled in undergraduate and graduate prorams leading to degrees in areas directly related to law enforcement. These loans can be canceled at the rate of 25% for each year of employment in a public local, state or Federal law enforcement agency. Awards of these loans are subject to current restrictions of Department of Justice (LEAA) priority guidelines.

Law Enforcement Student Grant program—Available to full-time employees of a publicly funded law enforcement agency. Payments up to $400 per semester are provided to full-time and part-time students working toward degrees in this field. A recipient must agree to remain with a law enforcement agency for two years after completion of studies funded by this grant.

Student Employment

College Work-Study program—A federal assistance program designed to enable students having financial need to work both during the summer and through the school year, thus earning a substantial portion of their college expenses. Work assignments are made on campus and also with public and private nonprofit agencies such as the YMCA, YWCA, New Haven Boys' Club, City of New Haven, State of Connecticut and South Central Criminal Justice Planning Agency.

Bursary work—The university provides many jobs on campus for deserving students who may benefit from this type of employment. Awards are made each semester of approximately $500 for working an average of 15 hours per week.

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STUDENT ACTIVITIES AND OTHER SERVICES

John W. Ghoreyeb
Dean of Students
Carole Aiken
Director of Women's Affairs
Director of Equal Opportunity
Title IX Coordinator
David DuBuisson
Director of Financial Aid
Foreign Students Advisor
Richard L. Gelgauda
General Manager, WNHU
Peter A. Rogers
Director of Minority Students Affairs
Christian F. Poulson
Director of Career Development
Philip S. Robertson
Director of Housing and Health
George A. Schaefer
Coordinator of Veterans Affairs
Michael W. York
Director of Counseling
Samuel M. Baker Jr.
University Librarian
Edward George
Director of the Computer Center

Joseph A. Machnik
Director of Athletics
Lawrence C. Parker
Director of Development
and Alumni Relations
Mark Dougherty
Manager of the Book Store

Alumni Association

Membership in the Alumni Association is acquired immediately upon graduation. All degree graduates of the university as well as diploma graduates of the School of Executive Development and the Management Center become members automatically. Including the class of 1976, there are more than 7,500 members of the Alumni Association. A member of the administrative staff of the university serves as director of Alumni Relations. An executive committee conducts the affairs of the association during the period between meetings and also serves as a planning group. There is an alumni fund chairman for annual giving.

In addition to the semiannual meeting, other meetings of social and educational interest occur during the year, and a quarterly publication, the *Alumni News*, is mailed without charge to each alumnus. Alumni Homecoming is an annual event occurring in October of each year.

The Alumni Association is represented on the Board of Governors by the member who is elected to the board for a term of two years. The president of the association serves on the Board of Governors as an ex-officio member.

Membership of the Alumni Advisory Council is by invitation. In addition to the officers of the Alumni Association, 20 or more additional graduates of the university constitute the group. The council is an advisory board to the university on the conduct of alumni affairs. Its primary objectives are to strengthen alumni relations, advise on matters of top-level policy involving the alumni, improve alumni communications and assist in planning and conducting alumni events. The council meets quarterly at the university with the president and the director of Alumni Relations.

Veterans Affairs

Since the university has one of the largest veteran enrollments in Connecticut, an Office of Veterans Affairs with a full-time staff is maintained. The Veterans Administration has assigned to the university a full-time V.A. representative who maintains liaison directly with state and national V.A. offices. In addition to processing applications for various V.A. benefits, the campus Veterans Office provides a wide range of supportive services for veterans attending the university. Assistance is available in academic areas, and special help such as funding for tutorial assistance, readers for the blind and aid for the disabled is also available. The Organization for Veterans Affairs provides information about veterans' programs and activities on campus.

Women's Affairs

The office of the director of Women's Affairs is located on the second floor of the main building. Activities of special interest to women are coordinated through the director, who meets regularly with women students. Personal counseling is available at any time.

Career Development and Off-Campus Employment Office

This office has two primary functions within the university: career advising and providing information about off-campus employment. It is located on the second floor of the Student Services and Admissions Building on the South Campus.

CAREER DEVELOPMENT

To assist students in making career choices, individual counseling is available and is supplemented by other resources. Special workshops on resume preparation, interviewing skills and job research techniques are scheduled in both the fall and spring semesters.

In addition, the office maintains an extensive library of career information resources on careers in general and specific employers.

OFF-CAMPUS EMPLOYMENT

While the office is not an employment service, listings of both full- and part-time positions are maintained to provide a common

meeting ground for employers and prospective employees. Students will find this useful both in locating part-time employment while in school and full-time employement following graduation.

Employers wishing to list positions with the Off-Campus Employment Office need only call or write, giving a description of the position available and other details. There is never any fee charged foi this service.

ON-CAMPUS RECRUITMENT

During each academic year, employer representatives visit the campus to interview graduating University of New Haven students, both graduate and undergraduate. In addition, representatives of a number of graduate schools visit to interview seniors interested in pursuing graduate education.

Students at all stages of their education are urged to make use of the office's resources in formulating career plans. Alumni seeking positions are invited to use the services of the office.

NEWSLETTERS

The Career Development and Off-Campus Employment office publishes two newsletters on a regular basis. The *Student Affairs Newsletter* is published on the third Monday of the month during the undergraduate academic year. The newsletter contains information about events on campus and, particularly, events presented by the Career Development Office including workshops and recruitment visits.

The *Jobsletter* is published biweekly throughout the year except on university holidays and contains job listings received by the Off-Campus Employment Office. Both publications are distributed around the campus. The *Jobsletter* will be mailed to any member of the university community who wishes it and provides the office with a supply of stamped, self-addressed envelopes for the number of issues desired.

Counseling

Individual counseling is offered to students for personal problems, for marital and domestic problems and for study and career choice problems. Students can obtain assistance for educational, vocational and general life problems.

A student who does not know where to go for help should contact the Counseling center for information and direction.

TESTING

The Counseling Center of the University of New Haven offers psychological testing including vocational interest, personality assessment and academic placement. Students who are unsure of their academic skills, eventual career choices or life goals may request help in these areas.

As a service to first-semester seniors and members of the community who are planning to apply to graduate schools, a controlled testing center is maintained on campus. Arrangements may be made with the center for administration of the Miller Analogies Test and the forwarding of the score to the graduate school of the applicant's choice. All students wishing to take the Miller Analogies Test should contact the Counseling Center.

Housing and Meal Plans

ON-CAMPUS HOUSING

The Residence is of modern design, containing 16 separate suites. Each suite consists of six double bedrooms opening out to a large living room. Each bedroom contains individual beds, desks, chest and closets. Laundry facilities, snack bar and common lounge are also available in the dormitory. The Residence is coeducational; men and women are each assigned to eight suites.

Applications to live in the Residence will be filled in the order received. To be considered, each application for residence must be accompanied by a $100 room reservation deposit. The total deposit is refundable if there is no available space. The Residence contract is for the complete undergraduate school year (fall and spring semesters.) The $100 reservation deposit will then become a security deposit and will be deducted from the second semester's room charge.

The university Residence is closed during the Thanksgiving, Christmas and Spring recesses.

MEAL PLANS

Two meal plans are available to students at the university. The 15-meal plan gives the student three meals per day from Monday through Friday. The 20-meal plan offers the student three meals per day Monday through Saturday and two meals on Sunday. The meal plans offer complete, well-balanced meals for a sizeable saving as compared to buying meals individually.

All dormitory students are required to have a meal plan. It is suggested that off-campus residents within walking distance of the university participate in one of the two meal plans.

OFF-CAMPUS HOUSING

Because there are a limited number of off-campus apartments and rooms in the immediate area, the university is unable to guarantee off-campus accommodations to meet a student's choice.

The University Housing Office will have listings of available housing in the general area. These listings will be posted in the Housing Office during the latter half of July.

In entering into an arrangement of private housing, the financial terms should be discussed and implemented by the student himself. The university is, of course, not responsible for these arrangements, but will make every effort to see that the student is treated fairly.

Health Service

PHYSICAL EXAMINATION

Students are requested to provide a report of a recent physical examination to the Health Service upon acceptance to the university so that the Health Service will have available past medical history in case of an emergency. Appropriate forms for this purpose are available.

INFIRMARY

The Infirmary, located in the Residence, is available for emergency first-aid treatment and examination for all students without charge. Day beds are provided for rest and care of mild illnesses for students living on or off campus. The university health staff, under the direction of the Director of Housing and Student Center, includes an internist, nurses and a psychologist. As part of the infirmary program, a women's health center clinic is held twice monthly.

ACCIDENT AND HEALTH INSURANCE

The University of New Haven Student Insurance Plan is another important service to full-time students and their families. It was conceived and planned by the Day Student Government and is designed to help full-time students of the university meet unexpected and, very often, costly medical bills arising from an accident, and hospital and medical expenses required by sickness.

The plan provides protection while the student is at home, at school or on a vacation, 24 hours a day for a full twelve months. Benefits are payable in addition to those the student may receive from any other policy. Details of the plan are available in a folder sent to all full-time students and from the university nurse.

Student Activities

STUDENT COUNCILS

Separate day and evening student councils have the responsibility for initiating, organizing and carrying through extracurricular activities and for liaison between students and the university staff.

CLUBS AND ORGANIZATIONS

There are almost 40 university student clubs and societies open to interested students. Included are student chapters of professional societies, religious organizations, social groups and special interest clubs.

CULTURAL ACTIVITIES

There are student organizations formed around interests in literature, art, films and drama. These groups sponsor visiting artists and lecturers, publish materials and generally provide a well-rounded cultural program for University of New Haven students.

FRATERNITIES AND SORORITIES

Many national and local service, social and honorary fraternities and sororities are active on campus. They sponsor programs such as the semiannual bloodmobile and other services as well as social functions.

PUBLICATIONS

Student publications include *The News,* the university student newspaper; *The Chariot,* the annual yearbook; the *Noiseless Spider,* a literary publication; and the *Student Handbook.* Students may volunteer their services on any of the student publications.

RADIO STATION

WNHU, the university's student-operated FM stereo broadcast facility, operates throughout the year on a frequency of 88.7 MHz at a power of 1,700 watts. This extracurricular activity, open to all university students, serves southern Connecticut with the best in music, news and community affairs programming. Its sportscasters are the voice of University of New Haven Charger sports teams. The WNHU broadcast day consists mostly of locally produced shows. However, selected Intercollegiate Broadcasting System and National Public Radio features are also presented.

In its first year, WNHU gained national attention when announcer Tony Salzo set a 270-hour world record for longest continuous broadcast. In 1974, WNHU again achieved national prominence by winning *Broadcast Management/Engineering* magazine's "Best Station Award."

All WNHU activities in programming, business and engineering operations are performed by students in the university's day, evening and graduate divisions. The station will train all qualified students in their respective areas of interest.

SOCIAL ACTIVITIES

The social calendar is filled with varied events to appeal to all students: mixers, concerts, films, free parties to climax each semester, cabarets and Homecoming.

STUDENT CENTER

The Student Center provides a focal point for all student activities. Offering lounges, student offices, a game room, a large cafeteria and a snack bar, the facility has been designed to serve as a center for the student's non-academic college interests.

The Rathskellar, also located in the Student Center, opens daily, serving draft beer and snacks. Live entertainment is often presented in the Rathskellar on the weekends.

Computer Center

The Computer Center offers time sharing and batch processing giving the student the opportunity to learn such computer languages as FORTRAN, COBOL, PL/1, APL, RPG, Assembler and simulation programs and a variety of engineering statistical packages that are a part of many course offerings. Undergraduate degrees in computer technology and business data processing are now offered, as well as a graduate degree in computer and information science. The highly sophisticated equipment available makes it possible for the university's training to meet the complex needs of business and industry.

The Computer Center is staffed by degreed computer professionals and uses student operators whose interests lie in the computer field.

More than 85 percent of computer time is given to academic service, which provides active training to more than 700 students each semester.

Library

The Marvin K. Peterson Library, named in honor of the former president of the university, was opened in 1974. It has a capacity of 300,000 bound volumes. Adjoining the Main Building, it includes a rare book room, a special collection room, a music room, archives and spacious reading and reference areas. Study is made convenient by modern research facilities and equipment including microreading stations and microform and microfilm reader-printers.

The library contains more than 200,000 volumes, 53,000 U.S. government documents, 6,500 record albums, numerous corporate annual reports, pamphlet files and microfilm. The library subscribes to 1,000 periodicals and extensive back issue files are maintained.

The resources of both the New Haven and West Haven public libraries are available to students (nonresidents must pay a fee). Under a reciprocal arrangement, University of New Haven students may borrow materials from the libraries of Albertus Magnus College or Quinnipiac College by presenting a valid identity card.

Bookstore

The university's bookstore provides all necessary texts, new and used, that are required for courses at the university. It also carries related supplies, greeting cards, imprinted clothing, gifts, candy and a selection of paperbacks, newspapers and periodicals. The bookstore buys back used texts on a daily basis throughout the year. It also orders class rings and handles film processing for the campus community.

Foreign Students

The university is fortunate in having many countries represented in its student body. The Foreign Student Office provides special guidance when needed. The International Students Club at the university sponsors many activities and trips. In addition, the International Student Center of New Haven welcomes all foreign students to the many programs they sponsor and to full use of their facilities.

Minority Student Affairs

The director of Minority Student Affairs acts as a liaison between the administration and the minority students on campus. The director

works closely with the dean of students and the president of the university in making decisions which affect the welfare of minority students.

The Office of Minority Student Affairs is in the Main Building.

Department of Athletics

Athletic Director: Associate Professor Joseph A. Machnik, Ph.D., University of Utah.

Chairman, Physical Education: Assistant Professor Donald Wynschenk, M.S., Southern Connecticut State College.

Coordinator of Women's Athletics: Deborah Chin, M.S.P.E., University of North Carolina.

Coaching Staff

Baseball: Head Coach, Associate Professor Florindo Vieira, M.S., Southern Connecticut State College; Assistant Coach, Joseph Tonelli, M.S., University of North Carolina.

Basketball: Head Coach, William R. Farrow, M.S., Southern Connecticut State College.

Cross Country, Track: Head Coach, Robert Deobil, B.S., Southern Connecticut State College.

Football: Head Coach, Thomas Bell, M.A., University of Connecticut.

Golf: Head Coach, Al Nicholson, B.S., University of New Haven.

Hockey: Head Coach, Stephen Lane, B.A., University of Vermont; Assistant Coach, Arthur Crouse, B.S., Arnold College.

Lacrosse: Head Coach, William Verhoeff, M.A.T. Brown.

Soccer: Head Coach, Joseph Machnik; Assistant Coach, John Kowalski, B.S., University of New Haven.

Tennis: Head Coach, Donald Wynschenk.

Recognizing the importance of a broad range of physical and emotional outlets to a well-balanced college experience, the University of New Haven seeks to involve the student on various levels of active participation in games and sports, as well as to provide an opportunity for community and student support for its varsity intercollegiate program.

During the fall, varsity soccer, cross country, golf, baseball and women's tennis and volleyball are offered. In the winter, men's and women's basketball, ice hockey and track are the main attractions. During the spring, baseball, tennis, golf, lacrosse, outdoor track and women's softball keep UNH's athletic fields busy.

The University of New Haven is a member of the Eastern College Athletic Conference and the National Collegiate Athletic Association. Its teams have participated in many regional and national post-season tournaments. The 1976 soccer squad placed second in the NCAA Division II soccer championships held in Seattle, Washington, losing 2-0 to Loyola of Baltimore in the championship game after defeating the University of Missouri-St. Louis 2-1 in the semi-final match.

The athletic department coaching staff welcomes all interested candidates and invites active involvement in and support of its athletic programs.

The Intramural Program sponsors tournaments and competition for interested players in touch football, badminton, bowling, three- and five-man basketball, foul shooting, paddleball, handball, softball, tennis, floor hockey and volleyball. Interested students should check the North Campus bulletin boards for the dates and times of intramural contests.

The North Campus facility consists of six tennis courts, two softball fields, one baseball diamond, a multipurpose football-soccer-lacrosse field, a weight-training room, a steam room, two full-size basketball courts, a gymnastics area and locker and shower areas for students and faculty.

Courses in golf, sailing, badminton, bowling, tennis, karate, lifesaving, volleyball, racket ball, handball, dance and gymnastics are scheduled each semester.

A valid university ID card is required for entrance to the North Campus gymnasium or tennis courts during nonclass or free play hours. The gymnasium will be open for free play at times when regularly scheduled games and classes are not in progress. Students should take care to secure their lockers or leave properly identified valuables with the equipment manager when using any facility.

While members of the university's athletic teams are covered under an appropriate insurance policy, students who participate in intramurals and free play are not covered by such a policy and participate at their own risk. The university recommends that students who plan to use any North Campus facility for physical activity carry an appropriate insurance policy to cover medical costs in case of an injury.

Students with interests in activities not currently offered by either the athletic or physical education departments are encouraged to discuss these interests with department personnel. If sufficient interest is generated, these activities may be offered as part of the regular curriculum.

SCHOOL OF ARTS AND SCIENCES

Douglas Robillard, Ph.D., Dean

Master of Arts degree programs in

Community Psychology
Organizational/Industrial Psychology

Bachelor of Arts degree programs in

American Studies
Art
Biology
Communication
Chemistry
Fashion Design
Economics
English
Graphic and Advertising Design
History
Interior Design
Mathematics
Philosophy
Physics
Political Science
Psychology
Social Welfare
Sociology
World Music

Bachelor of Science degree programs in

Biology
Environmental Studies
Chemistry
Fire Science
Occupational Safety
Physics

Associate in Science degree programs in

Biology
Chemistry
Communication
General Studies
Graphic and Advertising Design
Journalism
Occupational Safety
Packaging and Package Handling

The ideals of a liberal education are intellectual and imaginative growth, freedom of thought and inquiry and a sense of personal worth. The active pursuit of wisdom, the enrichment of the spirit and the development of each individual as a person offer the world its best hope for the future.

It is the aim of the School of Arts and Sciences to offer students the opportunity for a liberal education which will enrich the mind while it prepares them to pursue their interests and goals. Courses and programs have been designed to appeal to a wide range of interests and to secure the commitment of each student who is seriously engaged in the acquirement of an education.

Education is made up of a great many things, and not all education takes place in the classroom or even on the campus. New Haven is an exciting cultural center which offers libraries, natural history museums, art museums and exhibitions and workshops for dance and the creative arts. A constant procession of speakers and performing artists comes to the New Haven area. The Shubert Theater presents pre-Broadway showings of new plays and road company performances of hit shows. Long Wharf Theater is the home of an excellent regional company offering a varied fare of classics and new plays, and the Yale Repertory Theater is innovative and exciting. Programs of old and new films are

offered on several college campuses in the area.

Speakers and performing artists are brought to the campus of the University of New Haven by the Arts and Sciences Forum. Each year, a series of concerts is organized by the Department of World Music. An annual arts festival allows artists to exhibit their work. The university's new library offers comfortable surroundings for study and leisure reading. It has an excellent collection of books, journals, periodicals and phonograph records.

In the School of Arts and Sciences, students are encouraged to pursue as broad-based a program of study as possible. The school offers the degrees of Bachelor of Arts, Bachelor of Science and Associate in Science.

Associate Degree Programs

The associate degree program is designed to encourage students to begin their college educations even though they do not yet want to commit themselves to a full, four-year course of study. By taking 60 or more credits, the student may earn the degree of Associate in Science in such fields as biology, chemistry, communication, graphic and advertising design, general studies, journalism, occupational safety or packaging and package handling.

The student wishing to pursue this option is encouraged to consult with the dean of the school or with the chairman in whose departments the associate degree program is offered. Students who complete associate degree work may wish to have their credits applied toward further study leading to the degree of Bachelor of Arts or Bachelor of Science.

Bachelor's degree programs

Concentrated study within a specific discipline leads to the award of the B.A. and B.S. degrees. Students pursuing these degrees may concentrate their major studies in such fields as American studies, art, biology, biological illustration, chemistry, communication, economics, English, environmental studies, fire science, graphic and advertising design, history, mathematics, occupational safety, philosophy, physics, political science, psychology, social welfare, sociology or world music. A system of advisement allows students to consult with members of the department in which a major is sought. Students are encouraged to seek advisement on all aspects of the programs they are studying.

Minors

It is highly recommended that students working toward a degree in one area of study give serious thought to organizing their elective courses so as to receive a minor in a second discipline. A minor usually consists of 18 credit hours devoted to the study of either a group of related subjects or subjects offered by one department. Minors are offered in aeronautical technology, anthropology, art, biology, black studies, chemistry, communication, English, fire science, history, journalism, mathematics, occupational safety, philosophy, physics, political science, psychology, social welfare, sociology, teacher education and world music. Students interested in studying for a minor should consult with the chairman of the department offering the minor.

Admission Criteria

An applicant for admission to the School of Arts and Sciences must be a graduate of an approved secondary school or the equivalent. While no set program of high school subjects is prescribed, an applicant must meet the standard of the university in respect to the high school average. Applicants must present 15 acceptable units of satisfactory work, including nine or more units of college preparatory subjects. Satisfactory scores on College Entrance Examination Board (S.A.T.) or American College Testing (A.C.T.) program tests are required.

Core Requirements

Students enrolled in degree programs in the School of Arts and Sciences take a group of core requirements, usually during the first two years of college training. These course requirements and those prescribed by the major department must be met by all arts and science students.

Bachelor of Arts

18 s.h.	English and Humanities
3	English Composition
3	English Composition and Literature
6	*Fine Arts
6	Literature

*Fine arts includes art, music, and theater.

24 s.h.	**Social Sciences**
3	Economics
6	History, Western Civilization I, HS 111, and Western Civilization II, HS 112
3	Philosophy
3	Psychology
3	Sociology
3	Political Science
3	A course chosen from any Social Science department
11-12 s.h.	***Science and Mathematics**
	Physics
	Chemistry
	Science
	Biology
	Mathematics

53-54 semester hours total

*Students must elect at least one semester of a laboratory science with lab.

Department of Biology, Environmental Studies and General Science

Chairman: Professor H. Fessenden Wright, Ph.D., Cornell University.

Professors: Dinwiddie C. Reams Jr., D.Eng., Yale University; Burton C. Staugaard, Ph.D., University of Connecticut.

Assistant Professors: Dennis L. Kalma, Ph.D., Yale University; Henry E. Voegeli Jr., Ph.D., University of Rhode Island.

Instructor: Joel W. Blaskey, M.A. Fairfield University, M.S., University of Bridgeport.

Biology provides one of the cornerstones of a liberal education by increasing the knowledge and appreciation of oneself and of other living

organisms in the ecosphere. As a major, biology prepares the student for professional or graduate training or for technical jobs in one of the health or life-science fields.

Because of the close relationship to chemistry, physics, psychology and sociology, biology provides an area for an academic minor concentration for students majoring in these and other disciplines such as business or engineering.

HONOR SOCIETY

Installed at the University of New Haven is a chapter of Beta Beta Beta, the honor society in biology. Full membership requires an average of 3.0 in biological courses and 3.0 overall. Students majoring in biology with lower grades and those majoring in other areas may affiliate as associate members. The society promotes scholarship, research and intellectual experiences outside of the classroom by presenting a series of guest lecturers during the school year.

Requirements for the degree Bachelor of Arts with a major in biology

Each program includes botany, zoology, microbiology, genetics and general ecology. In the B.A. and A.S. programs one or two terms, respectively, of General Biology with laboratory are required. The upper-level course requirements of each four-year program differ slightly, but each demands histology, bioorganic and biochemistry, and seminar.

Requirements for the degree Associate in Science with a major in biology

The Associate in Science degree program is essentially the first two years of the Bachelor of Arts program in biology. Many students, especially those enrolled in the Evening Division, may prefer to receive the associate's degree after the completion of the first two years of study. Students should meet with their advisor for further information concerning the associate's degree program in biology.

REQUIREMENTS FOR THE MINOR

A total of 21 credit hours which include general biology, botany, zoology, genetics, ecology and microbiology is required for the minor. An upper-level course may be substituted for general biology under certain conditions.

NUTRITION MINOR

Courses to be taken to fulfill the requirements for the nutrition minor are: Nutrition and Dietetics, SC 115; Fundamentals of Food Science, SC 116; Biochemistry I and II with Laboratory, SC 361 and SC 362; Microbiology with Laboratory, SC 301; Nutrition and Disease, SC 315; General Biology I and II, SC 121 and SC 122; and General Biology Laboratory I and II, SC 131 and SC 132. Human Biology, SC 123, may be substituted for General Biology II.

Requirements for the degree Bachelor of Science with a major in biology

Students who elect to receive a Bachelor of Science degree in the field of biology may choose from among many concentrations. The concentration in biology allows greater depth of study in specific biology courses than does the Bachelor of Arts program. Premedical, predental and preveterinary programs are also offered in the biology department in the Bachelor of Science degree program.

Students may select a combination of biology and education courses which would provide the necessary courses for certification to teach in the public school systems in Connecticut. A combination of biology and chemistry courses affords the concentration in biochemistry for students interested in this area. The minimum credit hour requirement for the B.S. degree is 128.

CONCENTRATION IN BIOLOGY

A total of 28 credit hours is required. The subjects listed under the minor must be completed plus two other upper-level courses. An example is the business biology program.

BIOENGINEERING

No rigid group of courses constitutes a minor or a concentration in bioengineering. Students wishing to follow such a program should

major in one aspect of engineering and take a minor (21 credit hours) or a concentration (28 credit hours) in biology. Consultation with the particular engineering and biology department chairmen should be made before starting the programs.

A program in bioengineering may be worked out by conference with a member of the engineering faculty and one in the biology department. A student majoring in engineering may take a concentration (28 or more credit hours) in biology, or a biology major may take a concentration in engineering.

PREMEDICAL PROGRAM

The premedical program is the most demanding, since it includes all the requirements of the top medical schools plus the requirements of the Biology Department and the School of Arts and Sciences. Calculus and science courses, specifically chemistry, are included in the program requirements. To graduate, 132 semester hours are needed.

CONCENTRATION IN BIOLOGICAL ILLUSTRATION

This innovative program is offered by the departments of biology and fine arts, and includes the combination of courses necessary for career advancement in this new field. For specific program requirements and further information, students should contact the chairman of either department involved.

Environmental studies

Environmentalists find employment in several diverse types of business, as well as in municipal, state and Federal governmental organizations. Besides testing the control of pollutants, jobs in equipment sales, administrative positions, laboratory research jobs, work with consulting firms and as industrial environmental safety experts are some employment opportunities for those majoring in this new area.

Usually specialized training is necessary if one eventually wishes an administrative job at a high salary level. These programs are designed to enable students to enter a graduate or specialty school to continue their education. Examples of this advanced study would be a graduate program of environmental studies or engineering, a school of forestry, a program in urban ecology or a school of public health.

A Master of Science program in environmental studies is offered by the Graduate School. This program has both an engineering and a science option. More may be learned about this program from the Graduate School catalog.

Requirements for the degree Bachelor of Science with a major in environmental studies

The Bachelor of Science degree in environmental studies offers concentrations in the following areas: air-water control and management, environmental health, and community ecology.

The three options of the Bachelor of Science program have a similar group of core subjects, but there is considerable variation among the upper-level courses of these programs.

The air-water option is oriented toward the engineering, chemical and biological testing, control and management of environmental pollutants.

The environmental health option stresses the biomedical aspects of the environmental pollutants as these affect mankind.

The community ecology program has less stress on the physical and biological sciences and on mathematics. It is sociologically oriented, and a large number of the specialty courses are in the areas of political science and public administration. Hence, this would be a useful major for one considering work in these fields or one concerned with town planning or environmental law.

Those students interested in one of the optional programs in environmental studies should write to the department chairman for a copy of the specific program that is of interest. Students who plan to enter one of these programs should consult with the department chairman before registration or during the first week of their first term at the University.

Requirements for the degree Associate in Science with a major in environmental studies

The associate's program is designed to lead directly into the bachelor's program if students wish to continue their studies. Evening students often prefer to obtain an associate's degree on their way to completing the requirements for the Bachelor of Science degree. The Associate in Science program provides a terminal degree for those who intend to work or already work in the environmental field, but who are trained in engineering, chemistry or business and lack the necessary background and training in biology and ecology required today in the practice of environmental control and management.

REQUIREMENTS FOR THE MINOR

The minor in environmental studies provides a useful background for students majoring in many other areas of study if they have concern for the environment. For example, students majoring in political science might well combine their program with a minor in environmental studies. Another useful combination is an environmental studies minor and a major in business administration.

For specific information concerning a minor in environmental studies, please consult with the department chairman.

Courses in biology, environmental studies and general science

Courses that are marked with an asterisk (*) are usually scheduled every other academic year.

SC 111-112 Physical Science Credit, 6 semester hours

The meaning of scientific concepts and terms and their relation to other areas of learning and to daily living. Development and unity of physical science as a field of knowledge. Includes astronomy, physics, chemistry and geology.

SC 113 Physical Science Laboratory Credit, 1 semester hour

Prerequisite: SC 111. To be taken with SC 112 or after. Direct experience with physical experimentation. Training in design, conduct, analysis and reporting of physical experiments. Emphasis on historically important theories and experiments. Laboratory Fee

SC 115 Nutrition and Dietetics Credit, 3 semester hours

Types of foods, vitamins, minerals, enzymes, hormones and the processes and products of digestion. Factors and effects of malnutrition and food additives. Concepts and composition of balanced and special diets.

SC 116 Fundamentals of Food Science Credit, 3 semester hours

Food sources, methods of preservation, storage, spoilage, sanitation, food contaminants and food as a waste product are discussed at an elementary level. One hour of class time per week will be devoted to field work. Does not constitute laboratory credit.

SC 121-122 General Biology I & II Credit, 6 semester hours

The major areas of biology, with concepts and theories of the science. Cell structure and function are stressed during the discussion of the various organ systems. Genetics, animal behavior, ecology, development evolution and taxonomy are covered during the second term.

SC 123 Human Biology Credit, 3 semester hours

Prerequisite: SC 121 or consent of the instructor. A condensed study of human anatomy and physiology stressing the major organ systems and emphasizing the nervous, skeletal, muscular, enodocrine, reproductive and sensory systems. Included are genetics, stress, physical anthropology, nutrition and contemporary biopsychology, law enforcement, sociology and social services. For laboratory credit, where needed, SC 132 may be taken concurrently or after completing the course.

SC 126 Astronomy Credit, 3 semester hours

An introduction to present concepts concerning the nature and evolution of planets, stars, galaxies and other components of the universe. The experimental and observational bases for these concepts are examined.

SC 131-132 General Biology Laboratory I and II

Credit, 2 semester hours

To be taken with or after SC 121 or SC 122. The microscopic examination of cells and tissues and the dissection of various organisms from the earthworm to the fetal pig. Other experiments relate to classroom materials.

Laboratory Fee

SC 135 Earth Science Credit, 3 semester hours

A dynamic systems approach to phenomena of geology, oceanography and meteorology. Emphasis on interrelations of factors and processes and on importance of subject matter to human affairs. Suitable for nonscience as well as for science majors.

SC 146 Fundamentals of Oceanography Credit, 3 semester hours

Description of major aspects of geological, chemical, physical and biological oceanography. Emphasis on human use and disuse of oceans. Suitable for nonscience as well as science majors.

SC 201 Genetics Credit, 3 semester hours

Prerequisites: SC 122; SC 123; SC 251 or SC 252. Mendelian genetics and developments that have produced the modern concept of inheritance; the role of DNA and theories of the chemical basis of heredity. Various aspects of human, medical and population genetics and the role of these in evolutionary processes.

***SC 202 Genetics Laboratory** Credit, 2 semester hours

Prerequisite: SC 201. Theory and techniques using flies, yeasts, bacteria and viruses to illustrate the classical genetic theories. An introduction to biometrics. One assigned lecture-laboratory session and one laboratory period unassigned. Laboratory Fee

SC 210 Human Anatomy and Physiology with Laboratory
Credit, 4 semester hours

Prerequisites: SC 121 and SC 131. Structure and function of the human body in health and disease. A study of the essential characteristics of all the organ systems and the way they contribute to the functions of the body as a whole. May be taken in place of SC 122, General Biology II, or SC 123, Human Biology. Course includes 3 class hours and one 3-hour laboratory per week. Laboratory Fee

SC 220 General Ecology with Laboratory Credit, 4 semester hours

Prerequisite: SC 251 or SC 252. The interactions of living organisms, including man, with each other and with their environment. Discussion of population regulation, habitats, food supply predation and distribution, community structure regulation, succession and diversity, ecosystems, geochemistry and energy. Laboratory Fee

SC 221 Human Ecology Credit, 3 semester hours

Ecosystem structure and function. Understanding human involvement in and alteration of ecosystems through use of resources and pollution. Economic, cultural and behavioral factors; overpopulation.

SC 223 Human Ecology Laboratory Credit, 3 semester hours

Prerequisite: SC 220 or any other course in ecology. Laboratory or field work devoted to current environmental regional problems, such as population trends, land use, resources, pollution, waste disposal and transportation. Laboratory work involves social, biological and physical aspects of ecology. The course includes two lectures and one laboratory per week.
Laboratory Fee

SC 224 Field Ecology Credit, 2 semester hours

Prerequisite: SC 220 (may be taken concurrently). One hour of class and one afternoon of laboratory in which basic ecological concepts will be demonstrated by the gathering and interpretation of field and laboratory data.
Laboratory Fee

***SC 225 Evolution** Credit, 3 semester hours

Prerequisite: SC 122. Biochemical and organic evolution are studied. Physical anthropology and paleontology; the relationship of evolution to genetics and ecology.

***SC 227 Entomology with Laboratory** Credit, 4 semester hours

Prerequisites: SC 122 and SC 132, or SC 251. Study of classification evolution, anatomy, development, ecology, life-cycle, genetics and systematics of insects, arachnoids and myriapods. Insects as major competitors of man, as disease carriers, and their influences on history and culture. Laboratory

exercises include culture, observation and dissection of insects.
Laboratory Fee

SC 251 Zoology with Laboratory Credit, 4 semester hours

Prerequisites: SC 121 and SC 131 or biology major. The general morphology and physiology of animals from the amoeba to man, taken phylum by phylum. Dissection of representative animals from the major phyla; special emphasis on the Phyla Invertebrata. Laboratory Fee

SC 252 Botany with Laboratory Credit, 4 semester hours

Prerequisites: SC 121 and SC 131 or biology major. The comparative structure, function, habitat and evolutionary relationships of plants; techniques of plant identification and classification. Field trips conducted when possible.
Laboratory Fee

SC 291-292 Biology Laboratory Teaching Credit, 2 semester hours

Prerequisites: SC 122 and SC 132, and consent of the instructor. Designed for prospective teachers, department majors and laboratory assistants. Students supervised by an instructor in techniques concerning laboratory instruction, testing, grading, purchase and inventory of supplies and equipment.

SC 301 Microbiology with Laboratory Credit, 4 semester hours

Prerequisites: SC 121 and SC 131; SC 251 or SC 252; CH 103. A history of microbiology and a survey of microbial life. Includes viruses, rickettsia, bacteria, blue-green algae and fungi; their environment, growth, reproduction, metabolism and relationship to man. Laboratory Fee

SC 302 Bacteriology with Laboratory Credit, 4 semester hours

Prerequisites: SC 122, SC 132, CH 103. Theoretical and laboratory study of the morphology, physiology and classification of bacteria. The application of these facts to agriculture, industry, sanitation, public health and disease. Laboratory Fee

SC 303 Histology with Laboratory Credit, 4 semester hours

Prerequisites: SC 121 and SC 131, or SC 251. Microscopic and chemical structure of normal organs and tissues and their cell constituents as related to function. Microscopic observations, tissue staining and slide preparation. Laboratory Fee

***SC 304 Immunology with Laboratory** Credit, 4 semester hours

The nature of antigens and antibodies, formation and action of the latter, other immunologically active components of blood and tissues and various immune reactions. Laboratory Fee

SC 307 Comparative Vertebrate Anatomy with Laboratory
Credit, 4 semester hours

Prerequisite: SC 251. The structure, origin and evolutionary history of the vertebrate organ systems. In the laboratory, representative species of each vertebrate class are dissected with attention given to the individual organ systems. Laboratory Fee

SC 308 General Physiology with Laboratory Credit, 4 semester hours

Prerequisites: SC 251, CH 106, PH 104, PH 106. Basic theories of physiology as applied to plants and animals. Practical aspects and experimental techniques studied in the laboratory Laboratory Fee

***SC 309 Plant Morphology and Taxonomy with Laboratory**
Credit, 4 semester hours

Prerequisite: SC 252. Comparative plant structure and reproduction, particularly as related to the classification of plants. Laboratory involves examination of microscopic slides, models, preserved specimens and dissected materials. Laboratory Fee

SC 315 Nutrition and Disease Credit, 3 semester hours

Aspects of diet in treating and preventing various symptoms and syndromes, diseases, inherited errors of metabolism and physiological stress conditions.

SC 320 Forensic Medicine Credit, 3 semester hours

Prerequisites: SC 123, SC 132, CH 106, and CJ 215. Introduction to the medico-legal aspects of medicine emphasizing the relationship of the natural sciences. Injuries from various causes, effects of poisons, sex-offenses, autopsies and estimation of time of death will be covered. History of forensic medicine, its limitations and progress, odontology, malpractice and organ transplants will be discussed.

SC 331 Animal Behavior Credit, 3 semester hours

Prerequisites: SC 122, P 111. Behavioral patterns of animals studied on a comparative basis. Laws and principles of ethology related to genetics, psychology, ecology, evolution, physiology and social structure.

SC 361 Bio-organic Chemistry, with Laboratory (Biochemistry I)
Credit, 4 semester hours

Prerequisites: SC 122 and SC 132, or SC 251; CH 106. Functional groups of organic compounds, the physiological properties of these classes of compounds, and the mechanisms of their elimination from the system. The interaction and synthesis of these compounds will also be studied. Lipid and carbohydrate metabolism covered. Laboratory Fee

SC 362 Biochemistry II with Laboratory Credit, 4 semester hours

Prerequisites: SC 361, or CH 104 and CH 108, or CH 301 and CH 302. Amino acids, proteins, enzymes, coenzymes, vitamins, carbohydrates, nucleaic acids, lipids and certain alkaloids are discussed as to their chemical, physical, and biological properties. Isolated enzyme reactions and the more important metabolic pathways are examined

Laboratory Fee

***SC 401 Embryology with Laboratory** Credit, 4 semester hours

Prerequisite: SC 251. Origin and development of tissues, organs and organ systems during the embryonic and post embryonic stages. In the laboratory, the chick is grown and studied at various stages.

Laboratory Fee

***SC 402 Cytology with Laboratory** Credit, 4 semester hours

Prerequisite: SC 362. Structure and basic concepts of cellular and tissue function on the molecular, subcellular and cellular level, problems and techniques of cellular biology. Tissue culture techniques in laboratory. The microscope and audiovisual equipment are also employed.

Laboratory Fee

***SC 501 Parasitology with Laboratory** Credit, 4 semester hours

Prerequisite: SC 251. Life history, physiology, morphology, reproductive cycle and economic importance of most common parasites of plants and animals. Spread and control of communicable and organic diseases.

Laboratory Fee

***SC 502 Fresh Water and Marine Ecology** Credit, 4 semester hours

Prerequisites: SC 251, SC 252, SC 222. Aquatic organisms, their life cycles and their ecological factors. Causes of pollution when equilibria are upset. Laboratory Fee

***SC 503 Pathology with Laboratory** Credit, 4 semester hours

Prerequisite: SC 251. Causes, symptoms, progress, effect and control of diseases of animals, primarily man. Laboratory observation of diseased cells, tissues and organs will be conducted partly at the University of New Haven and partly at St. Raphael's Hospital. Laboratory Fee

***SC 504 Phycology and Mycology with Laboratory**

Credit, 4 semester hours

Prerequisites: SC 251, SC 252, SC 301. Freshwater, marine algae and the various types of fungi. Structure, physiology, life cycles, reproduction, nutrition, ecology and their function as disease producers.

Laboratory Fee

***SC 505 Neuroendocrine Physiology** Credit, 3 semester hours

Prerequisites: P 111; SC 123 or SC 212. Morphology and physiology of the neurological and endocrine systems as related to the control of body functions. Relationship to behavior with examples from psychobiology and ethology.

SC 506 Sanitation and Food Science Credit, 3 semester hours

Prerequisites: SC 301-302. Aspects of various types of sanitation are covered, especially as related to food use, processing and preservation.

SC 507 Characterization and Treatment of Wastes with Laboratory

Credit, 4 semester hours

Prerequisites: SC 135; SC 361 or CH 201-202; CH 211; and M 117-118. The types of waste materials generated by agriculture, industry, transportation, municipalities and individuals are classified, and the methods of the detection and identification and treatment of each type of waste material are covered. Laboratory Fee

***SC 508 Water Quality Control and Pollution Ecology with Laboratory**

Credit, 4 semester hours

Prerequisites: SC 301 or SC 302; SC 502, SC 507. Recognition of the organisms and materials of polluted waters and the selection of the most appropriate means of collection and analysis. Proper choice and use of analytical methods for determining water quality and methods of analyzing the data. Laboratory Fee

SC 509 Scientific Photographic Documentation

Credit, 4 semester hours

3 lectures and 1 laboratory per week

Prerequisites: SC 121-122 or SC 251-252 and consent of the instructor. Theory and practice of photographic image formation and recording. Lecture, demonstration and laboratory experience. Photography and documentation of natural objects, organisms and artifacts of biological, medical, pathological and forensic interests. Photomicroscopic, ultraviolet, infrared, color and black and white techniques. Laboratory Fee

***SC 510 General Environmental Health** Credit, 3 semester hours

Prerequisites: SC 122 and SC 123, or SC 251; SC 301, or SC 302; and CH 106. Communicable diseases and their spread and control; environmental factors affecting public health; applications of the principles of sanitation and health to the solution of environmental problems. Population trends and the collection and evaluation of statistics concerned with public health. Various aspects of preventive medicine.

***SC 513 Environmental Pollutants with Laboratory**

Credit, 4 semester hours

Prerequisites: CH 104-108; CH 211 or SC 302; SC 361-362. Physical, chemical and biological properties and sources of the major pollutants. New and older methods of sampling, identification and measurement are presented. Laboratory Fee

***SC 514 Air Quality Control and Management with Laboratory**

Credit, 4 semester hours

Prerequisite: SC 513 (can be taken concurrently). Historical presentation and definition of air pollution problems. Approaches for abatement and the strategy to achieve objectives of air quality that meet regional standards. Fundamentals of meteorology. Health and welfare effects of air pollutants; political and legal control measures. Laboratory Fee

***SC 515 Biophysics I with Laboratory** Credit, 4 semester hours

Prerequisites: CH 106, SC 362, PH 104, PH 106, M 116. Principles and properties of large and small molecules in solutions, particularly in body fluids. Physical laws and theories of gases, liquids and solutions. Thermal chemistry and reaction rates as related to biological systems.

Laboratory Fee

***SC 516 Biophysics II with Laboratory** Credit, 4 semester hours

Prerequisites: CH 106, SC 362, PH 104, PH 106, M 116. Physical laws and theories as related to muscle, skeletal, sense organ, nerve and other physiological actions. Laboratory Fee

***SC 517-518 Biotechniques** Credit, 6 semester hours

Prerequisites: biology major and consent of the instructor. Clinical and research techniques used in the biological sciences. Advanced microscopy, photomicroscopy, cell and tissue culturation, clinical techniques and instrumental procedures. Laboratory Fee

***SC 519 Pharmacology with Laboratory** Credit, 4 semester hours

Prerequisites: SC 122 or SC 123, SC 132; or SC 251-252; SC 361 or CH 302. Science of medicinals and other chemicals and their effects produced by use and abuse on living organisms, and the mechanisms whereby these effects are produced. Relation of structure to activity methods of assay, and metabolic pathways involved. Laboratory Fee

***SC 521 Toxicology with Laboratory** Credit, 4 semester hours

Prerequisites: SC 122 or SC 123, SC 132; or SC 251-252; SC 361 or CH 202; CH 211. The action of chemicals on living organisms. Relation of structure to activity, mechanisms of detoxication and reason for activity are studied. Methods of isolation, identification and characterization from tissues, toxic limits, methods of assay, types of antidotes. Laboratory Fee

***SC 524 Psychobiology** Credit, 3 semester hours

Prerequisites: P 111, SC 122 or 123, SC 132, CH 106. A study of the biological factors of behavior, with concepts drawn from numerous related disciplines such as physiology, pharmacology, ethnology, ecology, anthropology, psychology and biochemistry

SC 591-592 Seminar Credit, 2 semester hours.
1 credit hour per term

Prerequisite: biology major in junior or senior year. One hour weekly meetings during which prepared papers are read by the members of the class. Each student, with his adviser, must select an article in a biological periodical from which is developed a 20-minute discourse on its contents.

SC 595-596 Laboratory Research

Credit, 1 to 6 semester hours per term

Prerequisites: biology major and consent of the department. Choice of a research topic, literature search, planning of experiments, experimentation and correlation of results in a written report, under the guidance of a department faculty member. Three hours of work per week required per semester hour. (Amount of credit indicated by A, B, C, etc., after the course number; e.g., SC 595B is two semester hours.)

Laboratory Fee

SC 599 Independent Study Credit, 1-3 semester hours, maximum of 6

Prerequisites: biology major; consent of the department. Weekly conferences with advisor. Three hours of work per week required per semester hour. (Amount of credit indicated by A, B, C, etc. after the course number; e.g., SC 599B is two semester hours.) Opportunity for the student, under the direction of a faculty member, to explore an area of personal interest.

Department of Chemistry

Chairman: Associate Professor Peter J. Desio, Ph.D., University of New Hampshire.

Associate Professors: Henry Lemaire, Ph.D., California Institute of Technology; William H. Nyce, M.S., Southern Connecticut State College.

This major is offered for those students who wish to avail themselves of the many career opportunities in the general field of chemistry, and for those who wish to go on to graduate work with a broad liberal background and a thorough grounding in a scientific discipline.

Career opportunities exist in the following areas: management, technical purchasing or sales, research, product control, production, and product development in the chemical, pharmaceutical or related industries; analysis and research in forensic science, energy, food, health, plastics, textile fibers, medicine, oceanography and the environmental sciences; sales and product development in the laboratory equipment field; and teaching.

In addition to the regular programs, a student may elect options in the following areas: biology, business, engineering, environmental studies, fire science, forensic science, predental, premedical or preveterinary. Courses in each option are taken instead of the normal electives. For details of the options, the department chairman should be consulted.

The University of New Haven has a chemistry club which is a student affiliate of the American Chemical Society (ACS) and is open to all chemistry majors. Students who are not ACS student affiliates may also be club members. The club provides students and faculty with a further chemical and social experience not found in classroom work. The chemistry club offers guest speakers, films, field trips and group discussions, as well as other activities. Students of the university community are invited to participate in all of the club's functions.

Requirements for the degree Bachelor of Arts with a major in chemistry

In addition to the core requirements, a student majoring in chemistry must complete the following courses for a total of 126 semester hours minimum: Calculus I, II and III, M 117, M 118 and M 203; Mechanics, Heat, and Waves with Laboratory, PH 150; Electromagnetism and Optics with Laboratory, PH 205; six semester hours of French, German, or Russian (German recommended); and 17 to 18 semester hours of electives (Introduction to Computers: FORTRAN, IE 102, and Advanced FORTRAN Programming, IE 224, recommended).

Also required are: General Chemistry I and II with Laboratory, CH 105 and CH 106; Organic Chemistry with Laboratory, CH 201 and CH 202; Quantitative Analysis with Laboratory, CH 211; Instrumental Methods of Analysis with Laboratory, CH 341; Advanced Organic Chemistry, CH 401; Advanced Inorganic Chemistry with Laboratory, CH 421; Physical Chemistry with Laboratory, CH 431 and CH 432; and Seminar I and II, CH 511 and CH 512.

Requirements for the degree Associate in Science with a major in chemistry

A student majoring in chemistry will find employment opportunities in the areas of industry, government, and academic institutions. Positions are available as laboratory technicians or specialists in chemical, medical, forensic and environmental laboratories. An A.S. in chemistry provides the chemistry background needed for admission to medical, dental or veterinary schools.

The chemistry major must complete the following requirements for the Associate in Science degree for a total of 71 semester hours: Composition, E 105; Composition and Literature, E 110; six semester hours of elementary German or Russian or electives; Calculus I, II and III, M 117, M 118 and M 203; Western Civilization I, HS 111; Introduction to Psychology, P 111; Mechanics, Heat and Waves with Laboratory, PH 150; Electromagnetism and Optics with Laboratory, PH 205; General Chemistry I and II with Laboratory, CH 105 and CH 106; Organic Chemistry with laboratory, CH 201 and CH 202; Quantitative Analysis with Laboratory, CH 211; Instrumental Methods of Analysis with Laboratory, CH 341; three semester hours of a restricted elective; and six semester hours of English literature electives.

Requirements for the degree Bachelor of Science with a major in chemistry

In addition to the core requirements, a major in chemistry must complete the following courses for a total of 126 semester hours minimum: Calculus I, II and III, M 117, M 118, and M 203; Differential Equations, M 204; six semester hours of French, German or Russian (German recommended); Introduction to Computers: FORTRAN, IE 102; three semester hours of restricted elective (Advanced FORTRAN Programming, IE 224, recommended); 12 semester hours of electives; Mechanics, Heat and Waves with Laboratory, PH 150; and Electromagnetism and Optics with Laboratory, PH 205.

Also required are: General Chemistry I and II with Laboratory, CH 105 and CH 106; Organic Chemistry with laboratory, CH 201 and CH 202; Quantitative Analysis with Laboratory, CH 211; Instrumental Methods of Analysis with Laboratory, CH 341; Qualitative Organic Chemistry with Laboratory, CH 351; Advanced Organic Chemistry, CH 401; Advanced Inorganic Chemistry with Laboratory, CH 421; Physical Chemistry with Laboratory, CH 431 and CH 432; Thesis for Undergraduate Chemistry Majors with Laboratory, CH 451 and CH 452; Seminar I and II; CH 511 and CH 512; and a chemistry elective of 300-level or higher.

REQUIREMENTS FOR THE MINOR

Any students wishing to minor in chemistry should consult with the chairman of the department to plan their program. The minimum number of credits required is 19 with a maximum of 24. The minor in chemistry includes: General Chemistry I and II with Laboratory, CH 105 and CH 106; Elementary Organic Chemistry, CH 107, and Elementary Organic Chemistry Laboratory, CH 108, or Organic Chemistry with Laboratory, CH 201 and CH 202; Quantitative Analysis with Laboratory, CH 211; and Instrumental Methods of Analysis with Laboratory, CH 341, or an elective chosen from 300-level chemistry courses or above.

Courses in chemistry

The courses marked with an asterisk may, at times, be scheduled in the evening or in alternate years.

CH 103 Introduction to General Chemistry with Laboratory

Credit, 3 semester hours

Introductory course in inorganic chemistry dealing with elements, compounds, balancing equations, stoichiometry, nomenclature, chemical bonding, the periodic table and solutions. Laboratory work involves experiments related to the material covered in lectures. Laboratory Fee

CH 105 General Chemistry I with Laboratory

Credit, 4 semester hours

Prerequisite: CH 103, one high school unit of chemistry, or written qualifying examination. Brief review of fundamentals, application of nuclear reactions, thermochemistry, electrochemistry, the production and properties of metals, the properties of the halogen and sulfur groups and solutions. Laboratory work related to the material covered. Laboratory Fee

CH 106 General Chemistry II with Laboratory

Credit, 4 semester hours

Prerequisite: CH 105. Acids, bases, and salts; chemical equilibria; chemical bonding; solutions; the chemistry of nitrogen, carbon, silicon and boron; the use of spectroscopy to determine structure of compounds. Laboratory work includes experiments in qualitative analysis.

Laboratory Fee

CH 107 Elementary Organic Chemistry Credit, 3 semester hours

Prerequisite: CH 103 or CH 105 or consent of the department. A

one-semester introduction to one of the major fields of chemistry designed for students not majoring in chemistry. Nomenclature, structure and the principal reactions of aliphatic and aromatic organic chemistry will be studied.

CH 108 Elementary Organic Chemistry Laboratory
Credit, 1 semester hour

Prerequisite: CH 103 or CH 105 or consent of instructor. A laboratory course designed to accompany CH 107. The principal operations of organic synthesis such as refluxing, distillation, filtration and crystallization are studied and applied in a number of simple preparations. Laboratory Fee

CH 109 Chemistry for Modern Times Credit, 3 semester hours

Prerequisite: CH 103 or consent of the instructor. This is a general course dealing with the physical and chemical properties of substances used daily such as paints, plastics, cosmetics, vitamins, antibiotics, hormones and poisonous substances.

CH 110 Environmental Chemistry Credit, 3 semester hours

Prerequisite: CH 105 or consent of the instructor. A survey of the principal environmental contaminants and pollutants of air and water, including heavy metals, radioactive particles, insecticides, detergents and others. Chemistry sufficient to understand the properties of these materials and possible routes to their control will be introduced.

CH 115 History of Chemistry Credit, 3 semester hours

Prerequisite: CH 103 or consent of the instructor. The history of chemistry beginning with ancient civilizations through the middle ages and the alchemist's search for gold. The discovery of the various elements and the periodic table. The lives of chemistry's great men and women. Chemistry's contribution to the atomic age.

CH 120 Chemistry of Addicting and Hallucinogenic Drugs
Credit, 3 semester hours

Prerequisite: CH 103 or consent of the instructor. The properties, dosages, preparation and reactions of the addicting and hallucinogenic drugs. Alcohol, caffeine, nicotine, sedatives, stimulants, tranquilizers, LSD, mescaline, cannabis, narcotics and antidepressants.

CH 201-202 Organic Chemistry with Laboratory
Credit, 8 semester hours

Prerequisite: CH 106. The common reactions of aliphatic and aromatic chemistry with emphasis on reaction mechanisms. Laboratory assignments on the technique needed in organic synthesis.

Laboratory Fee

CH 211 Quantitative Analysis with Laboratory Credit, 4 semester hours

Prerequisite: CH 106. Theory and laboratory training in the preparation of solutions, volumetric and gravimetric analysis and the use of special laboratory instruments. Laboratory Fee

***CH 321-322 Plastics and Polymer Chemistry** Credit, 6 semester hours

Prerequisites: CH 106, CH 202. All phases of the plastics and polymers field, including the chemistry involved, methods, properties of the plastics and uses of the various materials.

***CH 341 Instrumental Methods of Analysis with Laboratory**

Credit, 4 semester hours

Prerequisites: CH 106, CH 211, CH 201. The theory of various instrumental methods, including visible, ultraviolet and infrared spectroscopy, gas chromatography, mass spectrometry and nuclear magnetic resonance spectroscopy. Laboratory identification of compounds by the methods discussed in the lectures. Laboratory Fee

***CH 351 Qualitative Organic Chemistry with Laboratory**

Credit, 4 semester hours

Prerequisite: CH 202. A one-semester laboratory course dealing with the systematic identification of organic compounds. Laboratory Fee

***CH 401-402 Advanced Organic Chemistry** Credit, 6 semester hours

Prerequisite: CH 202. The mechanism of organic reactions and advanced problems in synthetic organic chemistry.

***CH 421-422 Advanced Inorganic Chemistry with Laboratory**

Credit, 8 semester hours

Prerequisite: CH 431. Corequisite: CH 432. Modern structural concepts, reaction mechanisms, the application of principles of physical chemistry and bonding theory in inorganic chemistry. Laboratory Fee

***CH 431-432 Physical Chemistry with Laboratory**

Credit, 8 semester hours

Prerequisites: CH 106, PH 205, M 203. Fundamental laws of gases, thermodynamics, the theory of atomic and molecular structure, kinetics and phase equilibria. Laboratory work enables the student to evaluate this subject by studying physical and chemical data. Laboratory Fee

***CH 433 Advanced Physical Chemistry** Credit, 3 semester hours

Prerequisite: CH 432. Emphasis on the fundamentals of quantum mechanics, statistical mechanics, molecular bonding theory and spectroscopy.

***CH 441 Analytical Chemistry with Laboratory** Credit, 4 semester hours

Prerequisite: CH 431. Corequisite: CH 432. Application of instrumental methods to inorganic and organic methods of analysis, including mass, ultraviolet and infrared spectrophotometry, chromatography and electroanalytical analysis. Laboratory Fee

CH 451-452 Thesis for Undergraduate Chemistry Majors with Laboratory Credit, 4 semester hours

Prerequisites: CH 202, CH 432. An original investigation in the laboratory under the guidance of a member of the department. Oral discussion of the completed work before the staff at the end of the second semester. Final thesis report. Departmental approval required.

Laboratory Fee

***CH 461 Chemical Spectroscopy: Technique** Credit, 3 semester hours

Prerequisite: CH 432. Introduction to the elementary theory with emphasis on techniques and interpretation of data obtained in applications of infrared, Raman, visible, ultraviolet, nuclear quadrupole, electron spin and nuclear magnetic resonance spectroscopy to the solution of chemical problems.

CH 511-512 Seminar I and II Credit, 2 semester hours

Prerequisites: CH 202, CH 432. Reports and discussions in various fields of chemistry reviewed by students and staff.

CH 599 Independent Study

Credit, 1-3 credit hours per semester with a maximum of 12

Prerequisites: Consent of faculty member and chairman of department. Opportunity for the student under the direction of a faculty member to explore an area of interest. This course must be initiated by the student.

Plant Visitations Credit, none

Open to junior and senior chemistry majors. Visits to plants in the area to investigate plant and laboratory facilities in the chemical industry.

SC 361-362 Biochemistry I and II with Laboratory

Credit, 8 semester hours

See description under Science and Biology.

Program in Fire Science

BACHELOR OF SCIENCE
THIRD AND FOURTH YEAR PROGRAMS

The university offers a third- and fourth-year program of courses leading to the degree of Bachelor of Science in fire science. Students may choose to study either fire science administration or fire science technology.

Requirements for the degree Bachelor of Science with a major in fire science

A total of 129 semester hours must be completed for either Bachelor of Science degree. This includes the associate's degree credits, or their equivalent, earned at the University of New Haven or elsewhere. Equivalent work substitution is subject to evaluation by the director of fire science.

CONCENTRATION IN FIRE SCIENCE ADMINISTRATION

A student earning a bachelor's degree in fire science administration is able to apply modern management techniques to the development and operation of a fire department.

This program includes the following courses: Essentials of Fire Chemistry, FS 301; Fire Protection Fluids and Systems, FS 303; Arson Investigation, FS 402; Process and Transportation Hazards, FS 403; Research Project, FS 498 and FS 499; Pre-Calculus Mathematics, M 115, or Finite Mathematics, M 127; Survey of Calculus, M 116, or Elementary Statistics, M 128; Introductory Accounting, A 111; Principles of Economics I, EC 133; Management and Organization, MG 125; Industrial Relations, MG 231; General Physics II, PH 104; General Physics Laboratory II, PH 106; Introduction to Computers: COBOL, IE 105; Personnel Administration, IE 223; Cost Control, IE 233; Risk and Insurance, FI 227; Collective Bargaining in the Public Sector, PA 408; Contracts and Specifications, CE 407; and four electives.

As its name implies, this program is more deeply concerned with the technological aspects of fire science. The stress is primarily on fire prevention. Many of the courses cover various engineering fields adapted to the problems that will confront the fire technologist. The essentials of fire chemistry, dynamics, statics, the way in which materials behave under various conditions or stress including heat, process and transportation, the design of industrial structures and conveyances for the maximum protection of the worker and the public are essential areas of study.

Courses in fire suppression play a role almost equal to that of fire prevention. These include an investigation of fire suppression fluids and systems, hydraulics and thermodynamics. The student who completes this program is a planner, a designer of fire prevention systems, a judge of facilities and equipment.

The following courses are required: Essentials of Fire Chemistry, FS 301; Principles of Fire Science Technology, FS 302; Fire Protection Fluids and Systems, FS 303; Fire Detection and Control, FS 304; Arson Investigation, FS 402; Process and Transportation Hazards, FS 403; Special Hazards Control, FS 404; Research Project, FS 498 and FS 499; Calculus I and II, M 117 and M 118; Statics, CE 201; Hydraulics, CE 306; Basic Circuits/Numerical Methods, EE 201; Electrical Engineering Systems, EE 336; Dynamics, ME 204; Thermodynamics I, ME 301; and Engineering Materials, MT 200.

Courses in fire science

FS 301 Essentials of Fire Chemistry Credit, 3 semester hours

The examination of the chemical requirements for combustion, the chemistry of fuels and explosive mixtures and the study of the various methods of stopping combustion. Analysis of the properties of materials affecting fire behavior. Detailed examination of the basic properties of fire.

FS 302 Principles of Fire Science Technology Credit, 3 semester hours

Effect of fire on different types of construction, classes of occupancy hazard, levels of private and public protection, degrees of exterior exposure. Types of building construction, private water supplies, municipal water supplies and combination systems. Methods of employee fire control.

FS 303 Fire Protection Fluids and Systems Credit, 3 semester hours

Chemical properties of fluids used in fire suppression systems and operations. Design of water supply and distribution for fire protection. Laboratory study of operational and hydraulics problems.

FS 304 Fire Detection and Control Credit, 3 semester hours

Heat, sensitivity, thermostats, fusible elements, fire detection systems, designs and layouts, alarm systems, power sources, safeguards, municipal alarm systems, construction, installation and maintenance requirements, standards and codes. Automatic extinguishing systems, design and layout of water, gas and power systems.

FS 402 Arson Investigation Credit, 3 semester hours

Methods used in starting fires and methods of detection of fires started by arsonists. Instrumental methods that may be used to assist in the investigation of fires started under suspicious circumstances.

FS 403 Process and Transportation Hazards Credit, 3 semester hours

Special hazards of industrial processing, manufacturing and the transportation of products and personnel. Analytical approach to hazard evaluation and control. Reduction of fire hazards in manufacturing processes.

FS 404 Special Hazards Control Credit, 3 semester hours

Types of industrial processes requiring special fire protection treatment such as heating equipment, flammable liquids, gases, and dusts. Emphasis on fundamental theories involved, inspection methods, determination of relative hazard, application of codes and standards and economics of installed protection systems.

FS 405 Fireground Management Credit, 3 semester hours

A study of the effective management of suppression forces at various fire situations. Includes consideration of pre-fire planning, problem identification and solution implementation. Case studies of actual and theoretical fire incidents, command control concepts, maximum utilization of forces available, priorities of action and logistics at large-scale operations will be covered.

FS 498-499 Research Project

Credit, 3 semester hours over two-semester period

One lecture per week in FS 498; credit, 1 semester hour. One lecture and one laboratory session per week in FS 499; credit, 2 semester hours. Development of a student project and a written report in a specified area in fire administration or fire science technology with faculty supervision. Grade awarded upon completion of project. This is a two-semester course with FS 498 as a prerequisite for FS 499.

FS 599 Independent Study

Credit, 1-3 credit hours per semester with a maximum of 12

Prerequisites: Consent of faculty member and chairman of department. Opportunity for the student under the direction of a faculty member to explore an area of interest. This course must be initiated by the student.

Department of Communication

Chairman: Assistant Professor Thomas L. Nash, Ph.D., Michigan State University.

Associate Professor: Gilbert L. Whiteman, Ph.D., Michigan State University.

Assistant Professor: Steven A. Raucher, M.S., Brooklyn College.

The basis of all human understanding is communication. Words, in and of themselves have no meaning. Only people have meaning. The communication programs at the University of New Haven allow each student to develop interpersonal and mass communication skills and awareness through a sequentially patterned series of course offerings.

Complete information about the Bachelor of Science and Bachelor of Arts degree programs in communication is listed in the Business Administration section of this bulletin. Also included are course listings and information concerning communication as a minor field of study.

Department of Economics

Chairman: Associate Professor John Teluk, M.A., Free University of Munich.

Professors: Phillip S. Kaplan, Ph.D., The Johns Hopkins University; Joseph A. Parker, Ph.D., University of Oklahoma; Alan Plotnick, Ph.D., University of Pennsylvania; Franklin P. Sherwood, Ph.D., University of Illinois.

Associate Professors: Ahmed Mandour, Ph.D., University of Oklahoma; George Karatzas, Ph.D., New York University; Ward Theilman, Ph.D., University of Illinois.

Assistant Professor: Willard Peterson, M.B.A., Dartmouth College.

Economics courses provide a basis for an understanding of economic structures, a wide range of domestic and international issues and trends in the economic life of modern societies. Economics courses offer training in analysis of economic problems as an aid to the evalua-

tion of economic policies.

Introductory courses are designed to provide the foundation of economic knowledge which every citizen in a modern complex society should have in order to understand the decisions of individual economic units and the operation of a national economy as a whole.

The Department of Economics offers both the Bachelor of Arts and the Bachelor of Science degrees in economics. Complete information concerning these two programs is listed in the School of Business Administration section of this bulletin.

Department of English

Chairman: Professor Paul Marx, Ph.D., New York University.

Director of Freshman English: Assistant Professor Donald M. Smith, M.A., Columbia University.

Professors: Carroll P. Cole, D.F.A., Yale University; Robert T. Howling, Ph.D., Pennsylvania State University; Bertrand Mathieu, Ph.D., University of Arizona; Douglas Robillard, Ph.D., Wayne State University.

Associate Professor: David E. E. Sloane, Ph.D., Duke University.

Assistant Professors: Ramona Beeken, M.A., Trinity College; Srilekha Bell, Ph.D., University of Wisconsin; Bruce French, M.A., Harvard University.

The study of literature is at the heart of a liberal education. English and American literature taken together comprise one of the most noble monuments to man's intellect and creativity. In addition to its generally broadening effect, the study of literature will help the student to think critically and to make his writing and speaking more effective.

A major in English is looked upon very favorably by admissions officers of law, medical and dental schools. It is also good preparation for graduate work in such fields as business, education, urban planning, social work and public health. Employers in many areas of business, industry and government look favorably upon the college graduate who has both a rich background in literature and training in language. Such a person had breadth of knowledge and is able to communicate effectively.

Requirements for the degree Bachelor of Arts with a major in English

All English majors are required to take the English literature survey courses, E 211 and E 212, and the American literature survey courses, E 213 and E 214. English majors also must take these courses: History of the English Language, E 302; the two courses in Shakespeare, E 341 and E 342; and either Poe, Hawthorne, and Melville, E 392, or The American Transcendentalists, E 393. In addition, one course must be taken from each of the following three groups:

1. The Age of Chaucer, E 375; The Renaissance in England, E 323; English Drama to 1642, E 326; The Age of Donne and Milton, E 362.
2. Literature of the Neoclassic Era, E 371; Literature of the Romantic Era, E 353; Later Nineteenth-Century Literature, E 356.
3. English Novel I, E 390; English Novel II, E 391; Modern British Literature, E 361; American Literature Between World Wars, E 477; Contemporary American Literature, E 478; Studies in Literature (any course numbered between E 481 and E 498).

While study of a foreign language is not required, it is strongly recommended that the student who majors in English know at least one foreign language. Knowledge of a foreign language makes one more sensitive to the use and meaning of words in one's own language. Furthermore, knowledge of a foreign language widens one's perspective and deepens one's understanding through the insights gained into another culture. Students who are considering graduate study certainly should become competent in at least one foreign language.

So that students will become familiar with another culture, the department requires English majors to take at least one semester of Continental Literature, E 406, a course that focuses on the literature of a different major European culture each semester it is offered.

REQUIREMENTS FOR THE MINOR

A total of 18 semester hours in English, not including the two freshman-level courses, is required for a minor in English. This work must include the English literature survey courses, E 211 and E 212, and the American literature survey courses, E 213 and E 214.

THE ENGLISH CLUB

The club is open to anyone associated with the university. Its aims are to encourage students to a greater love of good writing and to

provide them with informal and diversified encounters with professional writers and discussions of the literary arts on campus. In addition to sponsoring films on writers and writing, lectures by well-known contemporary writers and group excursions to local stage productions, the English Club publishes the university's student literary magazine, *The Noiseless Spider.*

Courses in English

EF English as a Second Language One semester, no credit

Designed for foreign-born students whose English is inadequate to do college-level work. Particular emphasis on individual pronunciation problems and use of American English idioms. Laboratory required.

E 101 Reading Laboratory No credit

Intensive work to improve reading comprehension and speed.

E 103 English Fundamentals 3 semester hours, 6 class hours per week (refer to policy on placement testing)

Designed to increase awareness of the structure of English. Intensive practice in writing to improve the student's ability to construct effective sentences and paragraphs.

E 105 Composition Credit, 3 semester hours

Prerequisite: Satisfactory grade on English placement test or E 103. Theme writing with emphasis on organization and development, logic, use of evidence. Reading and discussion of essays to illustrate rhetorical principles and to stimulate intellectual growth.

E 110 Composition and Literature Credit, 3 semester hours

Prerequisite: E 105 or placement by the English department. Further practice in theme writing. Study of poetry, fiction and drama to develop understanding and appreciation.

E 114 Speech Credit, 3 semester hours

A disciplined approach to oral communication for freshmen. Objectives are to develop proficiency in locating, organizing and presenting material and to help the student gain confidence and fluency when speaking extemporaneously.

E 201-202 The Western Tradition in Literature I and II

Credit, 6 semester hours

Prerequisite: E 105. Selected translations of European prose, poetry and drama from Homer to the present.

E 206 Composition and Literature Credit, 3 semester hours

Prerequisite: E 105. Further practice in theme writing. Reading of poetry, fiction and drama to develop skill in analyzing and interpreting literature.

E 211-212 Survey of English Literature I and II Credit, 6 semester hours

Prerequisites: E 105, E 110. Readings in English literature from its beginnings to the present, with attention to historical and social backgrounds.

E 213-214 Survey of American Literature I and II

Credit, 6 semester hours

Prerequisites: E 105, E 110. Intellectual and literary movements from Colonial times to the present, with attention to historical and social backgrounds.

E 217-218 Survey of Black American Literature Credit, 6 semester hours

Prerequisites: E 105, E 110. Black American poets, novelists, essayists and dramatists from the Colonial era to the present, including such writers as Frederick Douglass, W.E.B. DuBois, Countee Cullen, Richard Wright, James Baldwin, Leroi Jones and Eldridge Cleaver.

E 220 Writing for Business and Industry Credit, 3 semester hours

Prerequisite: E 105. Intensive practice in the various types of writing required of executives, businessmen, engineers and other professionals, with emphasis on business letters, internal and external reports, evaluations and recommendations, descriptions of procedures and processes.

E 230 Public Speaking and Group Discussion Credit, 3 semester hours

Objectives are to develop proficiency in organizing and presenting material, and to give practice in speaking, group interaction, conference management and small group discussion.

E 260 The Short Story Credit, 3 semester hours

A critical study of the best stories of American and British writers as well as stories, in translation, of writers of other nationalities.

E 261 The Essay Credit, 3 semester hours

A study of contemporary essays and great essays of the past.

E 267-268 Creative Writing I and II Credit, 6 semester hours

Practice in writing the short story, poetry, drama, or nonfiction; choice of genre based upon inclination and ability of the student. Analysis of published materials and student work. May be taken for one or two semesters.

E 270 Forms of Contemporary Culture Credit, 3 semester hours

A study of contemporary culture in a variety of forms, including drama,

films, TV, periodicals, music, art. Students will be expected to attend performances and exhibitions. The goal of the course is to give the student a better understanding of the scope and meaning of contemporary cultural phenomena, and to further the development of the critical sensibility.

E 275 Film Studies Credit, 3 semester hours

A consideration of significant full-length feature films selected to represent a national school of film-making, a genre, the respective crafts of directors, performers and script-writers. Films will be shown in class and studied at the rate of about one a week.

E 301 Literary Criticism and Scholarship Credit, 3 semester hours

Major critical theories, with readings from Plato and Aristotle to the present. Bibliographic tools and methods of research.

E 302 History of the English Language Credit, 3 semester hours

The structure and development of English, including Indo-European origins and elements of Anglo-Saxon. Emphasis on Middle English and the transition to Modern English. Study of the distinctive coinages of American English.

E 323 The Renaissance in England Credit, 3 semester hours

Major writers of the English Renaissance, in poetry and prose, from Wyatt and Surrey in the early sixteenth century through Sidney and Spenser to Donne and Milton.

E 326 English Drama to 1642 Credit, 3 semester hours

The development of the English drama from its beginnings to the middle of the seventeenth century, excluding Shakespeare. Major emphasis upon the Elizabethan and Jacobean drama.

E 341-342 Shakespeare Credit, 6 semester hours

Introduction to representative comedies, histories, plays, tragedies and poems.

E 353 Literature of the Romantic Era Credit, 3 semester hours

Poetry and prose of the major Romantics—Wordsworth, Coleridge, Byron, Shelley, Keats, Lamb, and Hazlitt—with attention given to the milieu of the writers, the Continental background and theories of Romanticism.

E 356 Later Nineteenth-Century English Literature

Credit, 3 semester hours

Poetry and prose from 1830-1900. The works of Tennyson, Browning, Arnold, Swinburne, Carlyle, Mill, Newman, Ruskin and others studied in the light of the social, political and religious problems of the period.

E 361 Modern British Literature Credit, 3 semester hours

British fiction, drama and poetry from 1900 to the present. Includes works of Conrad, Joyce, Lawrence, Woolf, Huxley, Forster, Shaw, Yeats, Auden, Spenser and Dylan Thomas.

E 362 The Age of Donne and Milton Credit, 3 semester hours

Major writers of prose and poetry during the period 1600-1660: Donne, Milton, Burton, Bacon, Herbert and others.

E 371 Literature of the Neoclassic Era Credit, 3 semester hours

British writers of the period 1660-1789, with emphasis upon Dryden, Pope, Swift and Johnson.

E 375 The Age of Chaucer Credit, 3 semester hours

A detailed reading and critical study of Chaucer's *Canterbury Tales*, with some study of his predecessors and the medieval cultural milieu.

E 390 The English Novel I Credit, 3 semester hours

The development of the novel in England from Defoe to Dickens and Thackeray.

E 391 The English Novel II Credit, 3 semester hours.

The development of the novel in England from George Eliot and Hardy to the present.

E 392 Poe, Hawthorne and Melville Credit, 3 semester hours

A study of the poetry and fiction of the major representatives of the tragic outlook on life in mid-nineteenth century American literature, Poe, Hawthorne and Melville.

E 393 The American Transcendentalists Credit, 3 semester hours

An intensive study of the affirmative tradition in mid-nineteenth century American literature, with particular attention to the principal figures, Emerson, Thoreau and Whitman.

E 395 American Realism and Naturalism Credit, 3 semester hours

Readings in the works of such major realists as Howells, Twain, and James and important naturalist successors such as Frank Norris, Stephen Crane and Theodore Dreiser.

E 402 Modern Poetry Credit, 3 semester hours

A study of the works of representative twentieth-century British, American and Continental poets.

E 405 Modern Drama Credit, 3 semester hours

Principal movements in Continental, British and American drama from Ibsen to the present.

E 406-409 Continental Literature Credit, 3 semester hours each course

Selected poetry, drama, and fiction, in translation, of the European masters, primarily Russian, French, German or Spanish. Topic to be announced for each semester.

E 411-412 The Literature of Africa Credit, 6 semester hours

The chief writings, in English and in translation, of the prose writers, poets and dramatists of the African nations.

E 421 Contemporary Jewish Writers in America Credit, 3 semester hours

Intensive study of the poetry, prose and drama of such writers as Shapiro, Ginsberg, Bellow, Malamud, Miller, Roth, Friedman and others whose works have been influenced by their Jewish heritage and by the American literary tradition.

E 477 American Literature Between World Wars

Credit, 3 semester hours

A study of the achievements of the main figures of the heroic generation that flourished between the two world wars and brought about "America's Coming of Age." Poets Ezra Pound, T. S. Eliot, Robert Frost, Wallace Stevens and William Carlos Williams; novelists Hemingway, Faulkner, Fitzgerald.

E 478 Contemporary American Literature Credit, 3 semester hours

Intensive study of recent American fiction, poetry and drama.

E 481-498 Studies in Literature Credit, 3 semester hours each course.

Special topics in literature, which may include concentration upon a single figure, a group of writers or a literary theme. Several sections, each on a different topic, may run concurrently.

E 599 Independent Study

Credit, 1-3 semester hours per semester, with a maximum of 9.

Prerequisites: Consent of the instructor and chairman of department; restricted to juniors and seniors who have at least a 3.0 quality point ratio. Opportunity for the student under the direction of a faculty member to explore an area of interest. This course must be initiated by the student.

Courses in foreign languages

Coordinator: Assistant Professor Bruce French, M.A., Harvard University.

FR 101-102 Elementary French Credit, 6 semester hours

Stresses pronunciation, aural and reading comprehension, basic conversation and the fundamental principles of grammar.

FR 201-202 Intermediate French Credit, 6 semester hours

Prerequisites: French 101-102 or equivalent. Stresses the reading comprehension of modern prose texts and a review of grammar necessary for this reading. Students are encouraged to do some reading in their own areas of interest.

FR 301-302 Main Currents of French Literature Credit, 6 semester hours

Prerequisites: FR 201-202 or equivalent. Writings representative of significant currents in French literature from the Middle Ages to the twentieth century. Opportunity to improve listening and speaking ability. Conducted in French. Laboratory optional, but recommended.

GR 101-102 Elementary German Credit, 6 semester hours

Stresses pronunciation, aural and reading comprehension, basic conversation and the fundamental principles of grammar.

GR 201-202 Intermediate German Credit, 6 semester hours

Prerequisites: GR 101-102 or the equivalent. Stresses the reading comprehension of modern prose texts and a review of grammar necessary for this reading. Texts used in the course are selected from many areas of study including physics, biology and chemistry. Students are encouraged to read in their own areas of interest.

RU 101-102 Elementary Russian Credit, 6 semester hours

Stresses pronunciation, aural and reading comprehension, basic conversation and the fundamental principles of grammar. This course is usually offered every other year, unless demand requires it be taught every year.

RU 201-202 Intermediate Russian Credit, 6 semester hours

Prerequisites: RU 101-102 or the equivalent. Stresses the reading comprehension of modern Russian prose and a review of grammar necessary for this reading. Students are encouraged to do some reading in their own areas of interest. Scientific Russian is encouraged for those in the sciences.

SP 101-102 Elementary Spanish Credit, 6 semester hours

Stresses pronunciation, aural and reading comprehension, basic conversation and the fundamental principles of grammar.

SP 201-202 Intermediate Spanish Credit, 6 semester hours

Prerequisites: SP 101-102 or equivalent. Stresses the reading comprehension of modern prose texts and a review of grammar necessary for this reading. Students are encouraged to read in their own areas of interest.

SP 301-302 Main Currents of Spanish Literature Credit, 6 semester hours

Prerequisites: SP 201-202 or equivalent. Writings representative of significant currents in Spanish literature from the Middle Ages to the twentieth century. Opportunity to improve speaking and listening ability. Conducted in Spanish. Laboratory optional, but recommended.

Courses in theater arts

Coordinator: Associate Professor Ralf Carriuolo, Ph.D., Wesleyan University.

T 131-132 Introduction to the Performing Arts Credit, 6 semester hours

Dramatic arts such as theater, opera, ballet, film. Historical development, particular problems, special possibilities and informed appreciation. Practical work in a medium.

T 141-142 World Drama and Theater Credit, 6 semester hours

Dramatic literature from classical times to the present.

T 341-342 Acting and Directing Credit, 6 semester hours

Emphasis on acting during the first semester and directing during the second. The student may participate in workshop productions.

T 491-492 Performing Arts Seminar Credit, 6 semester hours

Prerequisite: Consent of the instructor. Special areas of the performing arts: drama, film, dance, radio, television. Criticism, writing, directing, performing, design.

T 599 Independent Study

Credit, 1-3 semester hours per semester with a maximum of 12

Opportunity for the student under the direction of a faculty member to explore an area of interest. This course must be initiated by the student.

Department of Fine Arts

Chairman: Associate Professor Elizabeth Moffitt, M.A., Hunter College.

Assistant Professor: John E. Devine, M.F.A., Yale University; Edward J. Maffeo, M.A., Columbia University.

Study of the visual arts provides opportunity for self realization and gives the individual a perception of his relationship to society. The various programs are designed to develop an esthetic sensitivity to visual materials and the psychic response to them leading the student to the formulation of his own expressive statements in a variety of fields. Foundation courses in the basics of two and three dimensional design, color and drawing, plus work in such major disciplines as painting and sculpture, provide the student with the necessary vocabulary for effective visual communication.

An awareness of the development of art throughout man's cultural evolution, from the cave man to the present day, is provided through the study of art history and the contemporary art scene. With this combination of the development of his own creative powers with a sense of the art historical matrix of which he is a part, the student also acquires an excellent preparation for graduate study in such fields as art education, graphic design, industrial design, environmental design, architecture, communication, fine arts and art history.

Career opportunities for those competent in the visual arts are numerous, including art directors in a broad field of business and industry. The student may also choose to develop his creative potential by following a number of vocational programs offered at the university in such fields as biological illustration, interior design, fashion design and graphic and advertising design.

Requirements for the degree Bachelor of Arts with a major in art

The art major must complete a minimum of 42 hours of art for the bachelor's degree in fine arts. Flexibility of planning is provided, but the student must adhere to the following basic outline of courses: Introduction to Studio Art, AT 101 and AT 102; Basic Drawing I, At 105; Painting I, AT 201; History of Art to the Renaissance, AT 231; History of Modern Art, AT 232; Design I and II, AT 211 and AT 212; Figure Drawing, AT 302; and Studio Seminar I, AT 401.

Art majors are encouraged to select courses in art beyond the minimum requirements. The student should consult with a faculty advisor concerning the requirements for the major in the fields of biological illustration, interior design, fashion design, and graphic and advertising design. An Associate in Science degree is offered in graphic and advertising design which requires a minimum of 33 semester hours of art.

REQUIREMENTS FOR THE MINOR

A total of 18 semester hours of work in art is required for the minor in art. This may include Introduction to Studio Art I, AT 101; Design I, AT 211, or Design II, AT 212; Basic Drawing I, AT 105; and any other combination of courses which fills the student's needs and interests.

Requirements for the degree Bachelor of Arts with a major in interior design or fashion design

New Bachelor of Arts degree programs in interior design and fashion design have recently been instituted by the university. Students in this major oftentimes take courses in retailing from the School of Business Administration to round out their career and educational needs.

Students wishing specific information concerning the requirements for these two programs should contact their advisor within the Department of Fine Arts.

Courses in art

AT 101-102 Introduction to Studio Art Credit, 6 semester hours

Foundation study in the visual arts designed to heighten the student's sensitivity and awareness. Problems in drawing, painting and design using a variety of materials.

AT 104 Weaving Credit, 3 semester hours

Introduction to basic techniques, including tapestry, using simple looms with study of various fibers.

AT 105 Basic Drawing I Credit, 3 semester hours

A disciplined study in the fundamentals of freehand drawing including drawing objects from nature, study of perspective, exercises in coordination of hand and eye. Manipulation of line for articulation of form and space. Figure drawing.

AT 106 Basic Drawing II Credit, 3 semester hours

A continuation of AT 105 with emphasis on perspective and depiction of three-dimensional space and form by two-dimensional means. Study of architectural forms, natural objects and landscape.

AT 122 Layout and Printing Techniques Credit, 3 semester hours

Prerequisites: AT 211 or AT 212; AT 312 or consent of the instructor. Techniques of layout, lettering and design in relation to printing methods.

AT 201 Painting I Credit, 3 semester hours

Problems in pictorial composition involving manipulation of form and color. Various techniques of applying pigment will be explored as well as mixing pigments, stretching and priming canvases.

AT 202 Painting II Credit, 3 semester hours

A continuation of AT 201 with further exploration of two-dimensional pictorial arrangements of form and color for greatest visual effectiveness. Students will be encouraged to develop their own personal idiom in the medium.

AT 203 Commercial Art I Credit, 3 semester hours

Prerequisites: AT 211 or AT 212; AT 122 and AT 312 or consent of the instructor. Exploration of basic graphic design problems emphasizing typography and composition to develop the student's ability to communicate ideas and feeling effectively through visual means.

AT 204 Commercial Art II Credit, 3 semester hours

Prerequisite: AT 203 or consent of the instructor. A continuation of AT 203 with emphasis on the application of design principles to actual job situations from the original concept to the mechanical.

AT 205 Ceramics I Credit, 3 semester hours

Introduction to clay as an expressive medium. Hand-built and wheel-thrown methods with various glazing and decorative techniques. Stacking and firing kilns. Laboratory Fee

AT 206 Ceramics II Credit, 3 semester hours

Continuation of AT 205 with free exploration of novel and experimental approaches to the medium. Laboratory Fee

AT 211-212 Design I and II Credit, 6 semester hours

Exploration of basic visual elements; line, color, texture, shape, size, volume, space and the psychic response they elicit. Effective organization of visual means in both two- and three-dimensional design. Interaction of color.

AT 231 History of Art to the Renaissance Credit, 3 semester hours

World art as an expressive and social phenomenon from its earliest beginnings, through religious and cultural cycles to the visual developments of the Renaissance.

AT 232 History of Modern Art Credit, 3 semester hours

Art from the Renaissance to the twentieth century in Europe and America; a continuation of AT 231.

AT 233 History of Interior Design Credit, 3 semester hours

A survey of developments in the decorative arts from antiquity to the present day. Special consideration of the esthetic and practical relationships of architectural space to interior decor.

AT 302 Figure Drawing Credit, 3 semester hours

Study of the human figure and anatomy with exploration of various methods of graphic and expressive depiction of its shifting axes and volumes. Use of a variety of drawing materials.

AT 304 Sculpture I Credit, 3 semester hours

The exploration of three-dimensional materials for maximum effectiveness in expressive design. Experimentation with clay, plaster, wood, stone, canvas, wire screening, metal, found objects. Laboratory Fee

AT 305 Sculpture II Credit, 3 semester hours

A continuation of AT 304 with further exploration of three-dimen-

sional materials and the possibilities they present for creative visual statements. Laboratory Fee.

AT 312 Lettering Credit, 3 semester hours

Prerequisite: AT 211 or permission of the instructor. Design and execution of basic hand lettering with pen and brush; utilization of hand lettering and type in the design of printed matter; use of letter forms as an element of visual design.

AT 313-314 Photography I and II Credit, 6 semester hours

Introduction to basic techniques, materials and esthetic aspects of black-and-white photography. Laboratory course with emphasis on the individual student's image making. Photography II gives special attention to problems dealing with images in groups, series and sequences. New techniques and technical demonstrations. Laboratory Fee

AT 317 Interior Design Credit, 3 semester hours

Prerequisites: AT 211 or 212; AT 233 or consent of the instructor. A basic studio course with exploration of interior design problems and their relationship to architecture. Special emphasis on exploitation of space, form, color and textures for greatest effectiveness.

AT 319 Textile Design Credit, 3 semester hours

Prerequisites: AT 104; AT 211 or AT 212 or consent of the instructor. Studio course in design of fabrics; study of various fibers and their characteristics for practical application in fashion and interior design. Laboratory Fee

AT 320 Fashion Design Credit, 3 semester hours

Prerequisite: AT 211, AT 212 or consent of the instructor. Studies in fashion design with particular attention to the characteristics of various fabrics; color, texture, pattern and draping qualities as used in fashion applications.

AT 322 Illustration Credit, 3 semester hours

A solid foundation in the techniques of creative illustration. Various media and their expressive possibilities will be studied; charcoal, pencil, pen and ink, wash, colored pencils, acrylic.

AT 331 Contemporary Art Credit, 3 semester hours

Art as an expressive and social phenomenon from 1945 through the developmental happenings of the present.

AT 333 Survey of Afro-American Art Credit, 3 semester hours

Black art in the United States from the Colonial period to the present. Consideration of African cultural influences. Analysis of modern trends in Black Art.

AT 401 Studio Seminar I Credit, 1-4 semester hours

Prerequisites: AT 101-102, AT 201, AT 302 or AT 313, and art electives. Drawing on developments through their previous study, students will concentrate on major projects in areas of their choice.

AT 402 Studio Seminar II Credit, 1-4 semester hours

Prerequisite: AT 401. Continuation of Studio Seminar I.

AT 599 Independent Study Credit, 1-3 semester hours per semester with a maximum of 12 semester hours

Prerequisites: Consent of the instructor and chairman of department. Opportunity for the student under the direction of a faculty member to explore an area of interest. This course must be initiated by the student.

Department of History

Chairman: Professor Thomas Katsaros, Ph.D., New York University.

Professor: Joseph B. Chepaitis, Ph.D., Georgetown University.

Associate Professor: Gwendolyn E. Jensen, Ph.D., University of Connecticut.

History provides the framework for a liberal education. The study of human experience—failures as well as achievements—is the core of historical study. It gives insight into related desciplines in the humanities and social sciences and broadens the perspective of students in professional fields of business administration and engineering, revealing the complexity and interrelatedness of human experience.

History is also excellent preparation for a variety of careers in business, government, law, journalism, foreign service and many other areas. Because of the great variety of professional programs at the University of New Haven, the student interested in history can combine this interest with highly technical professional training.

The department strives to meet its objectives by teaching not only content but also critical and writing skills through reading, class presentation and discussion, research and writing. Historical methodology is

stressed in all advanced courses, and students are urged to take the history seminar in their senior year to sharpen their critical and analytical skills.

The University of New Haven has a chapter of the International Honor Society in History, Phi Alpha Theta, which is open to those students who have had 12 hours of history or more and have maintained an average of better than 3.0 in history courses and better than 2.9 overall. The university chapter of Phi Alpha Theta provides the students and faculty with a social and intellectual experience beyond classroom work, offering films, speakers, and roundtable discussions. Students not eligible for membership in the society are welcome to participate in all of the chapter's activities.

Requirements for the degree Bachelor of Arts with a major in history

The history major must take at least 36 hours of courses in history. In addition to the basic survey of Western Civilization, HS 111 and HS 112, and American History, HS 211 and HS 212, majors are required to include in their major work either the History of Ancient Greece and Rome, HS 321, or Renaissance and Reformation, HS 317, and one course in Asian history, Modern Asia, HS 231; Modern Japanese History, HS 406; or Modern Chinese History, HS 409. The balance of the program will be worked out in consultation with an advisor.

The department offers majors in the general program as well as in specific area studies that include American studies, European studies and economic history. A student who wishes to major in one of these areas should consult with an advisor for specific requirements.

REQUIREMENTS FOR THE MINOR

A total of 18 semester hours' work in history is required for a minor in history. This work must include Western Civilization I and II, HS 111 and HS 112, and may include any other combination of courses in history that supports the student's interests and needs.

Courses in history

HS 111 Western Civilization I—to 1700 Credit, 3 semester hours

Europe from its ancient beginnings to the eighteenth century. Its social, economic, political and cultural history.

HS 112 Western Civilization II—from 1700 Credit, 3 semester hours

Europe and its global impact from the eighteenth century to the present. Political, cultural and institutional development.

HS 115 Economic History of the Western World—to 1914

Credit, 3 semester hours

A survey of the economic history of the Western World from pre-industrial Europe to World War I; historical, political, cultural and international developments.

HS 116 Economic History of the Western World—1914 to the Present

Credit, 3 semester hours

Prerequisite: HS 115. Western economic development within a historical perspective from 1914 to the present. The international background and the Western response.

HS 121 History of Science Credit, 3 semester hours

The development of science and technology from antiquity to the present. Their impact on society and the world.

HS 131 History of the Black Man in America Credit, 3 semester hours

The history and background of Black people in the United States. Social, political and cultural development.

HS 211 American History to 1865 Credit, 3 semester hours

Survey of American social, economic, political and diplomatic developments from Colonial times to 1865.

HS 212 American History from 1865 Credit, 3 semester hours

Survey of American history from 1865 to the present. Institutional and industrial expansion, periods of reform and adjustment. The U.S. as a world power.

HS 221 Comparative European Political Systems Credit, 3 semester hours

Historical, comparative approach to the political and social institutions of the United Kingdom, U.S.S.R., Germany and France.

HS 223 U.S. Diplomatic History Credit, 3 semester hours

The ideas, trends and interpretations of U.S. diplomacy from the American Revolution to the present.

HS 231 Modern Asia Credit, 3 semester hours

The ideological, cultural and traditional political, economic and diplomatic history of East, South and Southeast Asia from the sixteenth century to the present.

HS 308 U.S. Social and Intellectual History Credit, 3 semester hours

The ideological, cultural and social development of the American people. The impact of ideas on American life.

HS 310 The History of Modern England Credit, 3 semester hours

The development of British history from the medieval period to the present; England's role in international affairs.

HS 311 American Colonial and Revolutionary History to 1789 Credit, 3 semester hours

The cultural and political background of British North America, Colonial and Revolutionary America. The creation of a republican society.

HS 312 20th Century America Credit, 3 semester hours

The interaction of political, economic, social, intellectual and diplomatic events and their impact upon twentieth-century America.

HS 314 The History of Germany from 1648 Credit, 3 semester hours

German civilization from the seventeenth century to the present. Its impact on Europe and the world.

HS 315 The History of Europe in the Nineteenth Century Credit, 3 semester hours

European history from the Napoleonic period to World War I. Its internal development and world impact.

HS 317 Renaissance and Reformation Credit, 3 semester hours

Europe from 1300 to 1650; from feudal state to nation state; religious unity to diversity.

HS 321 The History of Ancient Greece and Rome Credit, 3 semester hours

The rise and decline of ancient Greece and Rome. Institutions and ideas that have shaped Western civilization.

HS 325 Europe in the Seventeenth and Eighteenth Centuries Credit, 3 semester hours

The cultural, political and economic life of Europe from classicism to the Napoleonic period; the Enlightenment.

HS 330 History of Russia Credit, 3 semester hours

The development of czarist Russia from 1200 to the Revolution of 1917; the U.S.S.R. from 1917 to the present.

HS 335 Modern European Intellectual Thought Credit, 3 semester hours

The intellectual, scientific and social thought from the Enlightenment to the present. The influence of ideologies on modern thinking.

HS 351-358 Selected Studies in History Credit, 3 semester hours

Special topics in history dealing with the modern world. A study in depth of vital historical issues.

HS 401 Europe in the Twentieth Century Credit, 3 semester hours

Recent and contemporary European history beginning with World War I. Institutional development and its changing role in world politics.

HS 406 Modern Japanese History Credit, 3 semester hours

The institutional and cultural traditions of Japan. The feudal period and subsequent modernization, postwar political, economic and cultural transformations.

HS 407 Colonial and Early Latin America Credit, 3 semester hours

The European and Indian origins of Latin America, the independence movement and the post-independence period to 1890.

HS 408 The History of Modern Latin America Credit, 3 semester hours

Latin America since 1890, Inter-American relations and current revolutionary movements.

HS 409 Modern Chinese History Credit, 3 semester hours

The ideological, cultural and historical background of China. The imperial order, Kuomintang and the Communist revolution to the present.

HS 410 A History of the Middle East Credit, 3 semester hours

The rise, spread and development of Islam to the present modern nationalisms: Turkish, Iranian, Arab and Zionist.

HS 413 A History of Africa in Modern Times Credit, 3 semester hours

The political and cultural history of North Africa. The colonial domination of sub-Sahara Africa and the emergence of the independent states after 1945.

HS 415 Historiography Credit, 3 semester hours

A survey of European and American historical thought, historical methods and contemporary historical writing.

HS 416 Senior Seminar Credit, 3 semester hours

The undertaking of an independent study and research project. Recommended for all history majors in their senior year.

HS 462 The History of the Commercial and Industrial Structure of the Soviet Union Credit, 3 semester hours

Prerequisites: EC 133, EC 134. The pre-1917 background. Problems

of planning: organizational framework, the implementation of Marxism as an economic system.

HS 463 The Business and Economic History of Modern Asia
Credit, 3 semester hours

Prerequisites: EC 133, EC 134. The historical development of the Asian economy in the nineteenth and twentieth centuries, emphasizing the post-war period.

HS 464 The Post-War Economic and Business Developments in Europe
Credit, 3 semester hours

Prerequisites: EC 133, EC 134. Europe in world trade and payments, the European economic community, business management and the welfare state.

HS 599 Independent Study
Credit, 1-3 semester hours per semester with a maximum of 12

Prerequisite: Consent of faculty member and chairman of department. Opportunity for the student, under the direction of a faculty member, to explore an area of interest. This course must be initiated by the student.

Journalism

Coordinator: Professor Paul Marx Ph.D., New York University.

Requirements for the degree Associate in Science with a major in journalism

The School of Arts and Sciences offers journalism as both an Associate in Science degree major and as a minor. A curriculum built around a minor in journalism and a bachelor's degree major in another arts and sciences area, such as communication, English, history, political science, social welfare or environmental studies, will provide an excellent undergraduate education for a potential journalist.

Courses in journalism

J 101 Journalism I Credit, 3 semester hours

A survey of journalism designed to acquaint students with the profession. The American newspaper as a social institution and a medium of communication.

J 102 Journalism II Credit, 3 semester hours

Prerequisite: J 101. The basic principles of journalism and the organizational patterns of the mass media. Some practice in reporting and the writing of news and feature stories.

J 201 News Writing and Reporting Credit, 3 semester hours

Prerequisite: J 101, J 102. The elements of news, the style and the structure of news stories, news gathering methods, copyreading and editing, reporting.

J 202 Advanced News Writing and Reporting Credit, 3 semester hours

Prerequisite: J 201. Intensive practice in news writing and reporting.

J 311 The Copy Desk Credit, 3 semester hours

Intensive practice in copyreading, editing and revising, headline writing, photograph selection, page make-up, and reporting. Regular critiques of the copy-desk work of major newspapers.

J 351 Journalistic Performance Credit, 3 semester hours

Students follow the coverage given to selected broad topics in the press. They prepare to make judgments of the coverage by doing research and becoming knowledgeable about the particular topic chosen. The course stresses analytical reading and responsible, informed criticism.

J 367 Interpretive and Editorial Writing Credit, 3 semester hours

Practice in the writing of considered and knowledgeable commentaries on current affairs and in the writing of interpretive articles based on investigation, research and interviews.

J 599 Independent Study Credit, 1-3 hours per semester

Prerequisites: Consent of the instructor and journalism coordinator. Opportunity for the student, under the direction of a faculty member, to explore an area of interest.

Department of Mathematics

Chairman: Associate Professor Richard M. Stanley, Ph.D., Yale University.

Professors: Joseph Gangler, Ph.D., Columbia University; Bertram Ross, Ph.D., New York University; Bruce Tyndall, M.S., University of Iowa.

Assistant Professor: David Naccarato, M.A., Wichita State University.

The programs of study in mathematics can provide a student with a basis for a career in business, teaching, or research, as well as for further studies in graduate school. Because mathematics is fundamental to so many fields, a degree in mathematics gives one an opportunity to diversify into areas such as engineering, physics, statistics, computer science, actuarial science and management science.

Students in mathematics should select electives in mathematics so that their course of study has a direction toward pure, applied or computer science mathematics. In addition, after consulting with an advisor, a mathematics major should choose electives in an area of interest outside of mathematics.

Students not majoring in mathematics are advised to consult their own department or the mathematics department about courses that are appropriate to their majors. The calculus sequence of courses, Pre-Calculus Mathematics, M 115; Calculus I, II and III, M 117, M 118 and M 203, are basically intended for majors in engineering, physical sciences and mathematics. The sequence of Pre-Calculus Mathematics, M 115, and Survey of Calculus, M 116, is intended for majors in areas such as social science, certain biological sciences, management science and forensic science.

Introductory College Mathematics, M 105; Elementary College Algebra, M 109; Algebraic Structures I, M 121; Finite Mathematics, M 127; and Elementary Statistics, M 228; are recommended electives for students in liberal arts, criminal justice, business administration or public administration and institutional management.

Requirements for the degree Bachelor of Science with a major in mathematics

A student majoring in mathematics must complete the following courses: Calculus I, II and III, M 117, M 118 and M 203; Differential Equations, M 204; Algebraic Structures I, M 121; Linear Algebra, M 231; Modern Algebra I, M 321; and Number Theory, M 325. In addition, the student must complete four 300-level or 400-level mathematics courses approved by the mathematics department and 12 semester hours of natural science or engineering courses selected under advisement.

REQUIREMENTS FOR THE MINOR

A student may minor in mathematics by taking six courses in mathematics beyond those usually required in the freshman year of the individual's major program. The minor program must be approved by the mathematics department and must include Calculus III, M 203, plus at least one course from the following: Algebraic Structures I, M 121; Linear Algebra, M 231; Modern Algebra I, M 321; or Number Theory, M 325.

Prospective minors in mathematics should consult with the mathematics department early in their academic careers as to the choice and availability of courses.

Courses in mathematics

All prerequisites for the following mathematics courses must be strictly observed unless waived by permission of the mathematics department.

M 001 Mathematics Review I No credit. Meets 3 hours per week

Required of both day and evening students who do not show sufficient understanding of mathematics fundamentals, as determined by entrance examinations. Natural numbers, integers, rationals and irrationals, properties and operations in each; construction and solution of mathematical models using simple equations, and percentages.

M 105 Introductory College Mathematics Credit, 3 semester hours

Introductory college mathematics for the liberal arts student including a variety of mathematical ideas chosen to illustrate the nature and importance of mathematics in human culture. An inductive approach based on experimentation and discovery.

M 109 Elementary College Algebra Credit, 3 semester hours

A review of the fundamental operations and an extensive study of functions, exponents, radicals, linear and quadratic equations. Additional topics include ratio, proportion, variation, progressions and the binomial theorem.

M 115 Pre-Calculus Mathematics Credit, 3 semester hours

Prerequisite: M 109. Designed to offer the foundation needed for the study of calculus. Polynomials, algebraic functions, elementary point geometry, plane analytic trigonometry and properties of exponential functions.

M 116 Survey of Calculus Credit, 3 semester hours

Prerequisite: M 115. An intuitive approach to topics in functions, analytic geometry, differential and integral calculus and probability. Designed for an insight into, and appreciation of, the methods of analysis.

M 117 Calculus I Credit, 4 semester hours

Prerequisite: M 115. The first-year college course for majors in mathematics, science and engineering; and the basic prerequisite for all advanced mathematics. Introduces differential and integral calculus of functions of one variable, along with plane analytic geometry.

M 118 Calculus II Credit, 4 semester hours

Prerequisite: M 117. Continuation of first-year calculus, including methods of integration, the fundamental integration theorem, differentiation and integration of transcendental functions and varied applications.

M 121 Algebraic Structures I Credit, 3 semester hours

A first course in and an orientation to abstract mathematics: elementary logic, sets, mappings, relations, operations, elementary group theory. Open to all freshmen and sophomores.

M 122 Algebraic Structures II Credit, 3 semester hours

Prerequisite: M 121. A continuation of M 121 including an introduction to groups, rings, fields and the real and complex number systems.

M 127 Finite Mathematics Credit, 3 semester hours

Basic discrete functions with numerous applications in the social sciences, elementary finite differences; topics from probability, matrices and introduction to linear programming.

M 137 Calculus Topics Credit, 4 semester hours

Prerequisite: consent of the department. The theoretical material of the standard first year of calculus, including limits, chain rules, mean value

theorems and a discussion of the fundamental theorem of integral calculus. Upon successful completion, the student is qualified for M 203.

M 203 Calculus III Credit, 4 semester hours

Prerequisite: M 118. The calculus of multiple variables, covering third-dimensional topics in analytics, linear algebra, and vector analysis, plus partial differentiation, multiple integration, infinite series and indeterminate forms.

M 204 Differential Equations Credit, 3 semester hours

Prerequisite: M 203. The solution of ordinary differential equations, including the use of Laplace transforms. Existence of solutions, series solutions, matrix methods, nonlinear equations and varied applications.

M 228 Elementary Statistics Credit, 3 semester hours

Prerequisite: One previous course in college mathematics. Includes basic probability theory, random variables and their distributions, estimation and hypothesis testing, regression and correlation. Emphasis on an applied approach to statistical theory with applications chosen from many different fields of study.

M 231 Linear Algebra Credit, 3 semester hours

Prerequisite: M 203. Linear spaces and systems, matrices, linear transformations, quadratic forms, eigenspaces and other topics.

M 301 Linear Analysis Credit, 3 semester hours

Prerequisites: M 204 and M 231. Linear vector spaces, infinite series, transformations, generalized Fourier series, solutions of partial differential equations.

M 303 Advanced Calculus I Credit, 3 semester hours

Prerequisite: M 204. A survey course in applied mathematics. Vector calculus: line and surface integrals, integral theorems of Green and Stokes, and the divergence theorem. Complex variables: elementary functions, Cauchy-Riemann equations, integration, Cauchy integral theorem, infinite series, calculus of residues and conformal mapping. An introduction to Cartesian tensors.

M 304 Advanced Calculus II Credit, 3 semester hours

Prerequisite: M 204. Topics from applied mathematics include: Fourier series, orthogonal functions, Bessel functions, Legendre Polynomials, Laplace and Fourier transforms, product solutions of partial differential equations and boundary value problems.

M 309 Advanced Differential Equations Credit, 3 semester hours

Prerequisite: M 204. Theoretical analysis and applications of nonlinear differential equations. Phase plane and space, perturbation theory and tech-

niques, series and related methods, stability theory and techniques and relaxation phenomena.

M 321 Modern Algebra I Credit, 3 semester hours

Prerequisites: M 121 and M 231. Groups, rings, integral domains, fields, polynomials.

M 325 Number Theory Credit, 3 semester hours

Prerequisite: M 121. Topics are selected from the following: mathematical induction, Euclidean algorithm, integers, number theoretic functions, Euler-Fermat theorems, congruence, quadratic residues and Peano axioms.

M 338-339 Numerical Analysis I and II Credit, 6 semester hours

Prerequisites: M 204 and IE 102. Approximation and error evaluation. Finite difference approximation by polynomial and orthogonal series; solutions of ordinary differential equations; solutions of elliptic, parabolic, and hyperbolic partial differential equations; interpolation and basic integral equation solutions.

M 341 Sets and Ordered Structures Credit, 3 semester hours

Prerequisite: M 121. Axiomatic set theory based on the Zermelo-Fraenkel theory, algebra of sets, relations and functions, finite and infinite sets, order, axiom of choice and its equivalents.

M 343 Projective Geometry Credit, 3 semester hours

Prerequisites: M 121 and M 231. Projective transformations, fixed points, invariants, cross-ratio, conics, Euclidean and non-Euclidean geometries.

M 345 Tensor Analysis Credit, 3 semester hours

Prerequisites: M 204 and M 231. The properties of vectors and tensors in Cartesian and in general curvilinear coordinate systems. Topics covered include: invariance properties, transformation laws, calculus of tensors, covariant differentiation, surface theory. Applications are considered in areas such as rigid body dynamics, elasticity, fluid mechanics, electricity and magnetism and geometry.

M 371 Probability Theory Credit, 3 semester hours

Prerequisite: M 203. Axiomatic study of probability: sample spaces, combinatorial analysis, independence and dependence, random variables, distribution functions, moment generating functions, central limit theorem.

M 381 Real Analysis I Credit, 3 semester hours

Prerequisites: M 121 and M 203. Foundations of analysis, sets and functions, real and complex number systems; limits, convergence and continuity, sequences and infinite series, differentiation.

M 412 Real Analysis II Credit, 3 semester hours

Prerequisite: M 381. Continuation of M 381 including Riemann-Stieltjes integration theory and an introduction to measure theory and the Lebesgue integral.

M 422 Modern Algebra II Credit, 3 semester hours

Prerequisite: M 321. Continuation of M 321 including topics such as: vector spaces, modules, commutative ring theory, Galois theory.

M 423 Complex Variables Credit, 3 semester hours

Prerequisite: M 381. For mathematics, science, and engineering students. Review of elementary functions and Euler forms; holomorphic functions, Laurent series, singularities, calculus of residues, contour integration, maximum modulus theorem, bilinear and inverse transformations, conformal mapping, and analytic continuation.

M 441 Topology Credit, 3 semester hours

Prerequisite: M 381. Topics selected from the following: Hausdorff neighborhood relations; derived, open and closed sets; closure; topological space; bases; homeomorphisms; relative topology; product spaces; separation axioms; metric spaces; connectedness and compactness.

M 472 Mathematical Statistics Credit, 3 semester hours

Prerequisite: M 371. Elements of the theory of point estimation, maximum likelihood estimates, theory of testing hypotheses, power of a test, confidence, intervals, linear regression, experimental design and analysis of variance, correlation, and nonparametric tests.

M 491 Departmental Seminar Credit, 3 semester hours

Independent study of some topic or topics approved by the chairman of the department. This work is done under the supervision of a faculty member. A paper and/or a seminar talk may be required.

M 599 Independent Study

Credit, 1-3 semester hours per semester with a maximum of 12

Prerequisite: Consent of faculty member and chairman of department. Opportunity for the student, under the direction of a faculty member, to explore an area of interest. This course must be initiated by the student.

Program in Occupational Safety and Hygiene

Coordinator: Professor Douglas Robillard, Ph.D., Wayne State University.

With the passage of the Occupational Safety and Health Act (OSHA) of 1970, new and more stringent requirements for safety are now in effect, and a high degree of professionalism in the job of safety manager is required.

The OSHA law applies to all employers, and consequently the demand for professionally competent people arises from industry, retailing services, hospitals, consturction, communication and government at all levels. In addition, there is a demand by labor unions and state and Federal government for endorsement administrators of this act.

Requirements for the degrees Bachelor of Science, and Associate in Science with a major in occupational safety

The demands placed upon the safety professional require a broad background in physics, chemistry, engineering, psychology and biology. The program is an interdisciplinary one that draws upon the resources of the schools of engineering, arts and sciences and business. In addition to required courses, there is a diversified offering of restricted electives with a proper balance of flexibility meant to meet the needs and interests of individual students.

Students may earn a certificate by completing a certain number of courses in the program. The Associate in Science degree and the Bachelor of Science degree are also awarded in the program.

Prospective students are encouraged to consult with the coordinator to determine credits and requirements.

Department of Philosophy

Chairman: Professor Ralf Carriuolo, Ph.D., Wesleyan University.

Professor: John Collinson, Ph.D., Johns Hopkins University.

Assistant Professor: Noreen Dornenburg, Ph.D., Yale University

Philosophy courses will assist a student in any major to understand himself and the world around him, and to see his area of interest in a broader perspective. A major in philosophy will help the student integrate a liberal arts education through systematic study of the basic problems of knowledge, language and reality.

Requirements for the degree Bachelor of Arts with a major in philosophy

A program planned with a member of the department to meet the particular needs of the student consists of 30 hours. All courses need not be offered by the Philosophy Department. Since the major is flexible, students have an opportunity to vary their programs and to incorporate philosophy into a double major.

REQUIREMENTS FOR THE MINOR

A planned program of 15 hours approved by a member of the department is required for the minor.

Courses in philosophy

PL 111 Introduction to Problems of Philosophy Credit, 3 semester hours

Man's place in the universe, how we discover truth, the nature of beauty and the good, the basis of moral choices.

PL 113 History of Philosophy through the Renaissance
Credit, 3 semester hours

Chronological introduction to problems of philosophy. Pre-Socratic, Plato, Aristotle, Medieval and Renaissance philosophers. May be substituted for PL 111.

PL 114 History of Modern Philosophy Credit, 3 semester hours

Chronological introduction to problems of philosophy. Seventeenth century to the present, including Descartes, Hume, Hegel, Nietzsche and contemporary philosophers. May be substituted for PL 111.

PL 124 Logic and Scientific Method Credit, 3 semester hours

Introduces the student to deduction, warranted induction and scientific description. May be substituted for PL 111.

PL 213-214 Contemporary Issues in Philosophy Credit, 3-6 semester hours

Current philosophical thinking in such areas as natural science, social science, metaphysics, religion, aesthetics, theory of knowledge, language, existentialism, ethics and positivism.

PL 222 Ethics in a Changing Society Credit, 3 semester hours

The major ethical systems in the framework of contemporary society. Ethical norms which point to goals of life and their relation to the issues in science, business, the professions and other human activities.

PL 225 Symbolic Logic Credit, 3 semester hours

Prerequisite: PL 124 or M 121. Formal deductive systems including the propositional calculus, the calculus of functions, independence of axioms, primitive symbols, interpretation, paradoxes, theory of types, Goedel's theorem.

PL 240 Philosophy of Science Credit, 3 semester hours

A study of the nature of scientific method, the logic of scientific explanation and theory construction, philosophical problems of selected sciences, questions peculiar to the social sciences.

PL 250 Philosophy of Religion Credit, 3 semester hours

Prerequisite: 3 semester hours of philosophy. An examination of some philosophical notions used in religious discourse; meaning, truth, fact, being, logic.

PL 252 Existentialism Credit, 3 semester hours

From its origin in the nineteenth century to contemporary manifestations. Kierkegaard, Neitzsche, Heidegger, Kafka, Sartre, R.D. Laing and others.

PL 260 Development of Jewish Thought I Credit, 3 semester hours

Jewish thinking and philosophy during the ancient and medieval periods. The Patriarchal period, early religion and law, the Prophets, the Hellenistic period, Talmudic Judaism, The Kabbalah and Medieval Judaism.

PL 261 Development of Jewish Thought II Credit, 3 semester hours

Modern and contemporary Jewish thinking and philosophy. Jewish mysticism, the pseudo-messianic movements, the Hassidic movement, the Reform movement and Zionism.

PL 322 Analysis and Criticism of the Arts Credit, 3 semester hours

Prerequisite: 3 semester hours of philosophy. The language used to talk about works of art. Form, content, expression, values, the ontological status of the art object.

PL 599 Independent Study

Credit, 1-3 semester hours per semester with a maximum of 12

Opportunity for the student under the direction of a faculty member to explore an area of personal interest. This course must be initiated by the student.

Department of Physical Education

Chairman: Associate Professor Donald Wynschenk, M.S., Southern Connecticut State College.

Associate Professors: Joseph A. Machnik, Ph.D., University of Utah; Donald Ormrod, M.S., Southern Connecticut State College; Florindo Vieira, M.S., Southern Connecticut State College.

Assistant Professors: Donald Burns, M.A., Teachers' College, Columbia University.

The Department of Physical Education strives to serve students faced with a future abundant in leisure time in the construction of healthful alternatives to the sedentary lifestyle characteristic of today's society. The university recognizes the importance of this mission and

requires two semesters of physical education for fulfillment of degree requirements.

Courses in leisure carry-over activities such as golf, tennis, bowling, sailing, swimming, life saving, handball and paddleball are augmented by traditional programs in team sports, volleyball, modern dance, slimnastics and the popular leisure living course which earns three credits and fulfills all physical education degree requirements.

It is hoped that the increased student interest in oriental combat and courses in recreational outdoor activities such as backpacking, camping, hiking and skiing will result in further development of course offerings. The department, as a service program, seeks to remain cognizant of the ever-changing leisure and recreational needs of university students and encourages students to creatively participate in program development.

In addition to the regular course program, the Department of Physical Education conducts a vast program of intramural competition for men and women. Tournaments in tennis, basketball, volleyball, softball, bowling, touch football, floor hockey, foul shooting and paddleball are offered. Participants should refer to the instructions in the student handbook concerning insurance and use of physical education facilities.

Courses in physical education

PE 100 Leisure Living Credit, 3 semester hours

Three distinct units designed to give the student a strong foundation of knowledge and skills for dealing with the abundance of leisure time and sedentary life style of today's society. Personal aspects of healthful living, first aid skill and technique and an in-depth study of leisure time activities such as tennis, sailing, golf, bicycling, aquatics, skating, bowling and racquet games including an examination of their historical, mechanical, physiological and sociological implications are offered. A separate grade is given for each one-credit section and completion of the three-credit course satisfies degree requirements for physical education.

PE 111-112 Physical Education (No credit, required for graduation.)

Each section emphasizes a different lifetime or carry-over sport designed to give the student the experience of developing ability and skill in a physical activity which will help meet the demands of a future characterized by an abundance of leisure time. Activities such as tennis, golf, volleyball, paddleball, handball, bowling, skating, swimming, sailing, skiing, softball, badminton and bicycling are taught in a recreational atmosphere created to encourage students to continue and further develop their interests and skills through involvement in intramurals and community recreation programs of a private or commercial nature. Students may register for as many sections or semesters of these courses as their interests warrant.

Department of Physics

Chairman: Professor Kee W. Chun, Ph.D., University of Pennsylvania.

Professor: Richard C. Morrison, Ph.D., Yale University.

Physics is concerned with the most basic aspects of our knowledge of the natural world. It is a subject in which experiment and theory evolve constantly to provide a precise and simple description of the physical phenomena around us in terms of a relatively small number of physical laws and theories.

As the most fundamental science, physics is at the root of almost all branches of science and technology. It has provided the microscopic basis for chemistry, has stimulated important developments in mathematics, is the basis of most branches of engineering, and, during the past decade, has proved to be increasingly valuable to the life sciences.

Consequently, a basic knowledge of physics is excellent preparation for diverse careers: research in university and government laboratories, industrial research and development, applied science and engineering, biological and medical sciences, research in environmental problems, and teaching at all levels from the elementary school to the university. It also prepares students for careers in nonphysics-related fields such as philosophy, business and law.

The department offers B.A. and B.S. degrees in physics. Degree requirements are kept flexible to allow each physics major to tailor a program suited to individual career interests. The department strives to provide a well-balanced, four-year program emphasizing both the theoretical and the experimental in the broad areas of classical and modern physics.

The University of New Haven has a chapter of the Society of Physics Students (SPS), a nationally recognized society operated within the Education Division of the American Institute of Physics. Its membership is open to anyone interested in physics. The society provides each student with an opportunity to participate in the physics community through regional and national meetings. Members of SPS receive a monthly journal, *Physics Today*, and SPS newsletters.

Requirements for the degrees Bachelor of Arts, and Bachelor of Science with a major in physics

Students majoring in physics, whether for a B.A. or B.S. degree, must complete the following departmental requirements: Mechanics, Heat and Waves with Laboratory, PH 150; Electromagnetism and Optics with Laboratory, PH 205; Modern Physics, PH 211; Analytical Mechanics, PH 301; Intermediate Electricity and Magnetism, PH 351; Advanced Laboratory, PH 373; Senior Project, PH 404; Nuclear Physcis, PH 415, or Atomic Physics, PH 401, or Solid State Physics, PH 406; as well as 12 semester hours of physics electives.

Also required are Calculus I, II and III, M 117, M 118 and M 203; Differential Equations, M 204; and six semester hours of mathematics electives; and General Chemistry I and II with Laboratories, CH 105 and CH 106.

Candidates for the Bachelor of Science degree in physics must complete an additional nine semester hours of restricted electives chosen from among physical science, engineering and mathematics. The balance of the program will be worked out in consultation with an advisor.

REQUIREMENTS FOR THE MINOR

A total of 18 semester hours of physics is required for the physics minor.

Courses in physics

PH 100 Introductory Physics Credit, 3 semester hours

Primarily for liberal arts and business students interested in a broad, nonmathematical understanding of physics. Emphasis on the basic concepts of physics, their application to our everyday environment and their impact on society.

PH 101 Energy—Present and Future Credit, 3 semester hours

Intended primarily for business and liberal arts students. Explores the nature, role and economic impact of energy in our society. Topics include: the nature and growth of energy consumption, physical limits to energy production and consumption, environmental effects and comparisons of energy alterna-

tives. Special emphasis on the technical, environmental and economic aspects of nuclear power as well as energy sources of the future such as fast breeder reactors, fusion, solar and geothermal power.

PH 103-104 General Physics I and II Credit, 6 semester hours

Primarily for life science majors with no calculus background. Basic concepts of classical physics: fundamental laws of mechanics, heat, electromagnetism, optics and conservation principles. Introduction to modern physics: relativity and quantum theory, atomic, nuclear and solid-state physics. Application of physical principles to life sciences.

PH 105-106 General Physics Laboratory I and II Credit, 2 semester hours

Should be taken concurrently with PH 103-104.

Laboratory Fee

PH 130 Radiation Safety Credit, 3 semester hours

Intended for students in occupational safety and hygiene, fire science, forensic science and related fields, as well as science and engineering students with interests in this area. Topics include: the nature of radiation and radioactivity, the interaction of radiation with matter, biological effects of radiation, detection and measurement of radiation, shielding considerations, dosimetry, and standards for personal protection.

PH 140 Radioactivity Laboratory Technique Credit, 2 semester hours

Prerequisite: One semester of laboratory science. Provides a practical working knowledge of radioactivity techniques to students in any branch of science, engineering or forensics, or to anyone wishing knowledge of the role of nuclear technology today. Experiments may be completed in biology, chemistry, engineering, forensics or physics, according to the interest of the student. Laboratory Fee

PH 150 Mechanics, Heat and Waves with Laboratory

Credit, 4 semester hours

Prerequisites: M 117 or instructor's consent (M 117 may be taken concurently). Introductory course for physical science and engineering majors. Kinematics, Newton's laws, conservation principles for momentum, energy and angular momentum. Thermal physics. Basic properties of waves, simple harmonic motion, superposition principle, interference phenomena and sound.

Laboratory Fee

PH 205 Electromagnetism and Optics with Laboratory

Credit, 4 semester hours

Prerequisites: PH 150 and M 118 (M 118 may be taken concurrently). Basic concepts of electricity and magnetism; Coulomb's law, electric field and potential, Gauss's law, Ohm's law, Kirchhoff's rules, capacitance, magnetic field, Ampere's law, Faraday's law of induction, Maxwell's equations, electro-

magnetic waves. Fundamentals of optics; light, laws of reflection and refraction, interference and diffraction phenomena, polarization, gratings, lenses and optical instruments. Laboratory Fee

PH 211 Modern Physics Credit, 3 semester hours

Prerequisite: PH 205 or PH 104. Modern physics fundamentals. Twentieth-century developments in the theory of relativity and the quantum theory. Atomic, nuclear, solid-state and elementary particle physics.

PH 270 Thermal Physics Credit, 3 semester hours

Prerequisite: PH 150 or PH 103. Laws of thermodynamics, entropy, applications to physical, chemical systems and thermal machines; elementary kinetic theory of gases; basic concepts of classical and quantum statistics.

PH 280 Lasers Credit, 3 semester hours

Prerequisite: PH 205 or PH 104. Laser theory, holography, construction and application to latest engineering and scientific uses.

PH 285 Modern Optics Credit, 3 semester hours

Prerequisites: PH 205 or PH 104. Introduction to the optical theories. Topics on the latest developments in optics. Application to life sciences and engineering.

PH 301 Analytical Mechanics Credit, 3 semester hours

Prerequisites: M 204 and PH 150, or instructor's consent. Intermediate analytical mechanics. Statics and dynamics of particles and rigid bodies. Emphasis on the theory of motion under central forces and on the use of the generalized coordinates; introduction to an elementary Lagrangian and Hamiltonian formalism; small vibrations.

PH 351 Intermediate Electricity and Magnetism Credit, 3 semester hours

Prerequisites: PH 205 and M 204. Electric field and potential using vector field formalism. Boundary conditions. Poisson's and Laplace's equations. Electromagnetic fields in cavities and waveguides. Electromagnetic waves.

PH 373 Advanced Laboratory Credit, 2 semester hours

Prerequisite: PH 211. Selected experiments in atomic and nuclear physics. Laboratory Fee

PH 400 Statistical Mechanics Credit, 3 semester hours

Prerequisite: Intructor's consent. An introductory course in classical and quantum statistical mechanics. The canonical ensemble; Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics and their applications; statistical interpretation of thermodynamics; transport processes.

PH 401 Atomic Physics Credit, 3 semester hours

Prerequisite: PH 211. Structure and interactions of atomic systems including Schrodinger's equation, atomic bonding, scattering and mean free path, radiative transitions and laser theory.

PH 404 Senior Project Credit, 1-6 semester hours

Open to senior physics majors. Individual projects in experimental or theoretical physics to be carried out under direct supervision of a faculty advisor.

PH 406 Solid-State Physics Credit, 3 semester hours

Prerequisite: PH 211. Introduction to the physics of solids with emphasis on crystal structure, lattice vibrations, band theory, semiconductor, magnetism and super-conductivity. Applications to semiconductor devices and metallurgy.

PH 415 Nuclear Physics Credit, 3 semester hours

Prerequisite: PH 211 or instructor's consent. Elementary nuclear physics. Nuclear structure, natural radioactivity, induced radioactivity, nuclear forces and reactions, fission and fusion, reactors and topics of special interest.

PH 451 Elementary Quantum Mechanics Credit, 3 semester hours

Prerequisite: PH 211 or instructor's consent. An elementary treatment of nonrelativistic quantum mechanics. Schrodinger's equation with its applications to atomic and nuclear structure; collision theory; radiation; introductory perturbation theory.

PH 470 Theory of Relativity Credit, 3 semester hours

Prerequisite: PH 211 or instructor's consent. Introduction to Einstein's theory of relativity. Special theory of relativity; Lorentz transformations, relativistic mechanics and electromagnetism. General theory of relativity; equivalence principle, Einstein's three tests, graviton, black hole and cosmology.

PH 599 Independent Study

Credit, 1-3 semester hours per semester with a maximum of 12

Prerequisites: Consent of faculty member and chairman of department. Opportunity for the student under the direction of a faculty member to explore an area of personal interest. This course must be initiated by the student.

Department of Political Science

Chairman: Professor Caroline A. Dinegar, Ph.D., Columbia University.

Assistant Professors: James Dull, M.A., University of Pennsylvania; Natalie S. Ferringer, M.A., University of Virginia; Joshua S. Sandman, M.A., New York University.

A major in political science provides the student with a foundation for a career in government service on the local, state, national, and international levels; for a career in law; for graduate school programs in political science, international relations and foreign affairs; and for careers in campaign management, communications, public relations and business. All political science and pre-law political science majors or minors should discuss career goals and program orientation with a departmental advisor at an early stage in order to select relevant courses in a total program.

Potential law students and graduate school students (in all disciplines) are urged to take the special LSAT and GRE preparation courses which are available through the Political Science Department and the Division of Special Studies.

Requirements for the degree Bachelor of Arts with a major in political science

A political science major is required to complete a total of 36 semester hours in the political science department, which must include American Government and Politics, PS 121; State and Local Government and Politics, PS 122; Modern Political Analysis, PS 261; Political Theory: Ancient and Medieval, PS 461; Political Theory: Modern and Contemporary, PS 462; and Senior Seminar in Political Science, PS 499 or PS 500. All political science majors should take either Elementary Statistics, M 228, or Statistics for Behavioral Sciences, P 301, as an elective.

REQUIREMENTS FOR THE MINOR

A student may minor in the department of political science by completing American Government and Politics, PS 121; State and Local Government and Politics, PS 122; and four other political science courses which should be chosen in conjunction with a departmental advisor and should be related to the student's area of interest and concentration.

The Institute of Law and Public Affairs

The Institute of Law and Public Affairs has been established to provide undergraduates with specific training in the areas of paralegal and public affairs. Students with an undergraduate major in any of the school of the university may attain paraprofessional status in legal affairs or public affairs by completing a minor in the institute. The term paraprofessional applies to those with special training in a professional field but who do not yet possess the terminal degree normally required in the profession. In many instances, paraprofessional status is a step toward the accomplishment of the final degree.

LEGAL AFFAIRS

The field of legal affairs prepares students for positions as office managers, administrative assistants, legal investigators, data researchers, legal library assistants and legislative researchers in private and public law firms and agencies. Students acquire specific skills which will enable them to do important legal work under the supervision of practicing attorneys. The legal affairs minor also prepares students for positions in the judicial system and for research positions and clerkships in the law libraries of the state.

PUBLIC AFFAIRS

The public affairs minor in the Institute of Law and Public Affairs is directed towards providing training for civil service positions at all levels of government. The goal of such training is to provide more effective public administrators and to introduce creativity into the profession of public service. The public affairs minor will take a problem solving approach to the discipline as students will be conducting basic, in-depth research on problems of governmental agencies. Students in this minor will be able to develop valuable insights into the nature of the public process from the vantage point of the bureaucracy.

Courses in political science

PS 101 Introduction to Politics Credit, 3 semester hours

A basic course for political science majors and for those interested in understanding politics; political components found in man; power, myths, community, obligation, equality, authority, change and justice.

PS 121 American Government and Politics Credit, 3 semester hours

A basic study of the American political system. Constitutional foundation, the political culture, Congress, the Presidency, the judicial system, political parties, interest groups, individual liberties, federalism, the policy-making process.

PS 122 State and Local Government and Politics Credit, 3 semester hours

Problems of cities, revenue sharing, community power structures, welfare, public safety, the state political party. big-city political machines, interest groups, state legislatures, the governor, the mayor, courts and judicial reform.

PS 201-202 Women and the Political Process Credit, 3 semester hours

The impact of women on the economic, social and political process; problems of integration and equalitarianism.

PS 203 American Political Thought Credit, 3 semester hours

Pre-revolutionary and revolutionary political thought; classical conservatism, liberalism, Jacksonian democracy, civil disobedience, social Darwinism, progressive individualism, pluralism and contemporary protest movements.

PS 216 Urban Government and Politics Credit, 3 semester hours

A study of the urban political process. Structures and organizations of urban governments, decision making, public policy, the "urban crisis," crime and law enforcement, party politics and elections, taxation and spending patterns, environmental problems, management of urban development.

PS 222 United States Foreign Policy Credit, 3 semester hours

Quantitative and qualitative examination of the foreign policy process; strategy and tactics of a super power in the twentieth century and the determinants of foreign and military policy.

PS 232 The Politics of the First Amendment Credit, 3 semester hours

Prerequisite: PS 121. Examination of the political implications of First Amendment freedoms of speech, press and religion; Supreme Court adaptation of the First Amendment to changing political and social conditions.

PS 241 International Relations Credit, 3 semester hours

Forces and structures operating in the modern nation state system; the foreign policy process; decision-making process; the impact of decolonization on traditional interstate behavior; economic and political developments since World War II.

PS 243 International Law and Organization Credit, 3 semester hours

Prerequisite: PS 241. Traditional and modern approach to international law and organization; major emphasis on the contribution of law and organization to the establishment of a world rule of law and world peace. The League of Nations system and the United Nations system are analyzed.

PS 261 Modern Political Analysis Credit, 3 semester hours

Introduction to the new approach of political analysis; personality and politics; political socialization; role and group theory; decision making; systems analysis and political violence.

PS 264 Political Development of the Third World Credit, 3 semester hours

Political climate of new states; problems of political unity and national integration, regionalism, nationalism, imperialism; political structures, problems of leadership and decision making.

PS 281 Comparative Political Systems: East Asia Credit, 3 semester hours

Traditional and modern political and social structures of China, Japan and Korea and the functioning of the political system within each country.

PS 282 Comparative Political Systems: Europe Credit, 3 semester hours

Political characteristics of modern European states. Emphasis on political, social and economic institutions, structures, the impact of modern European developments on integration. France, Germany, United Kingdom, USSR, Yugoslavia, Czechoslovakia, Sweden and Switzerland.

PS 283 Comparative Political Systems: Latin America

Credit, 3 semester hours

Political modernization, development in Latin America, political institutions, national identity, leadership, integration, political socialization and political ideologies.

PS 284 Comparative Political Systems: Africa Credit, 3 semester hours

Colonial background; constitutional framework. Political institutions and governmental structures of African states.

PS 285 Comparative Political Systems: Middle East

Credit, 3 semester hours

Colonial background, legal framework of nationhood; political, social

and economic structures of development. Turkey, Egypt, Lebanon, Syria, Jordan, Iraq and Iran.

PS 304 Political Parties Credit, 3 semester hours

Prerequisite: PS 121. Voting and electoral behavior; nominations and campaign strategy; pressure groups; political party structure and functions of the party system in the American political community.

PS 308 The Legislative Process Credit, 3 semester hours

Prerequisite: PS 121. Legislative process in the American political system; legislative functions; selection and recruitment of candidates; legislative leadership, the committee system; lobbyists; decision making; legislative norms, folkways and legislative-executive relations.

PS 309 The American Presidency Credit, 3 semester hours

The role of the President as Commander in Chief, legislative leader, party leader, administrator, manager of the economy, director of foreign policy and advocate of social justice; nature of Presidential decision making, authority, power, influence and personality.

PS 331 Political Theory and the Supreme Court Credit, 3 semester hours

Writings of prominent judicial theorists and political scientists on Supreme Court judicial decision making; the political impact of the Supreme Court; the judge as politician; implementation of judicial decisions in the political arena; current cases before the Supreme Court.

PS 332 Constitutional Law Credit, 3 semester hours

Prerequisite: PS 121. Principles and concepts of the United States Constitution as revealed in leading decisions of the Supreme Court and the process of judicial review.

PS 390 Political Modernization Credit, 3 semester hours

Comparative analysis of political change and development. Political transition, political integration and nation building; institutional developments; political parties; military elites, youth, intellectuals, the bureaucracy, economic development and political culture.

PS 422 State and Local Legislative Politics Credit, 3 semester hours

A mock legislative assembly running concurrently with the Connecticut General Assembly and dealing with the same issues. This legislature will hold committee meetings, public hearings, plenary sessions and press coverage using campus media.

PS 461 Political Theory: Ancient and Medieval Credit, 3 semester hours

Prerequisite: HS 111. Foundations of Western political thought: Plato, Aristotle, St. Augustine, St. Thomas Aquinas, Machiavelli, Hobbes, Locke,

Rousseau, Mill and Burke. An attempt will be made to apply the political thought of these thinkers to contemporary political questions.

PS 462 Political Theory: Modern and Contemporary Credit, 3 semester hours

Prerequisite: HS 112. Modern and contemporary political theories. Major characteristics of ideology, the psychological and sociological functions of theories, nationalism, the nature of totalitarianism, fascism, Nazism, Marxian theory, communism and democratic theory.

PS 494-498 Studies in Political Science Credit, 3 semester hours per course

Special studies on a variety of current problems and specialized areas in the field not available in the regular curriculum.

PS 499-500 Senior Seminar in Political Science Credit, 3 semester hours

Prerequisite: Permission of the department chairman. Construction and preparation of an individual research project in political science by the student and the presentation of that project in oral form within the seminar and in written form as the seminar thesis. Required of all political science majors.

PS 599 Independent Study Credit, 3 semester hours

Directed research on special topics to be decided upon in consultation with the chairman of the department.

Institute of Law and Public Affairs

Coordinator: Assistant Professor, Robert Harrison, J.D., Yale University.

Students majoring or minoring in political science may take only Anglo-American Jurisprudence, PS 230, and Judicial Behavior, PS 213, for credit. Exceptions may be granted by the director. Institute courses may, however, be taken for general elective credit.

PS 224 Public Attitudes and Public Policy Credit, 3 semester hours

A study of the sources of mass political attitudes and behavior and their effect upon public policy. The course will examine the techniques for influencing opinion including propaganda and mass media communications.

PS 225 Political Communications Credit, 3 semester hours

The dynamics of preparing effective public messages. The theory and application of social techniques to political persuasion: talks to win

attention, secure action and overcome prejudice. Other topics to be considered are the choice, arrangement and adaptation of materials; audience analysis and motivation.

PS 226 Family Law Credit, 3 semester hours

A study of legal relations between husband and wife including marriage, annulment, divorce, alimony, separation, adoption, custody agreements and basic procedures of family law litigation.

PS 228 Legal and Public Interest Groups Credit, 3 semester hours

This course will examine, through readings and field trips, various institutions in the legal culture. Emphasis on the purpose and function of each organization and on vocational opportunities. Among the institutions to be studied are the private and public interest law firm, administrative agencies, the New Haven Legal Assistance Corporation, the public defender's office, the state and local legislatures and state and federal courts.

PS 229 Legal Communications Credit, 3 semester hours

This course seeks to familiarize students with the kinds of legal documents and written instruments employed by participants in the legal process. Students will learn to recognize and understand the purpose of writs, complaints, briefs, memoranda, contracts, wills and motions.

PS 230 Anglo-American Jurisprudence Credit, 3 semester hours

This course will survey ideas about the nature of law. Among the legal philosophers examined will be Plato, Aristotle, St. Thomas Aquinas, John Austin, William Blackstone, Benjamin Cardozo, L. A. Hart and Oliver Wendell Holmes. The contribution to legal theory made by various schools of jurisprudence (e.g., positivism, legal realism) will also be examined.

PS 231 Judicial Behavior Credit, 3 semester hours

Examination of the American court system as a political policy-making body. Topics considered include: the structure of the judicial system, the influence of sociological and psychological factors on judicial behavior and the nature and impact of the judicial decision-making process.

PS 238 Legal Procedure I Credit, 3 semester hours

This course is designed to provide a practical knowledge of civil procedure for the pre-law and paralegal student. The student will follow the complete course of a lawsuit, comparing the procedural rules of Connecticut with the Federal Rules of Civil Procedure. Taught from the point of view of a practicing lawyer, pleadings, motions and legal definitions will be introduced and examined for their practical effect on the conduct of the lawsuit.

PS 239 Legal Procedure II Credit, 3 semester hours

An introduction to litigation techniques and procedures, including

skills needed to interview clients, negotiate settlements, take depositions and prepare for trial. Students will learn trial procedures and strategies by participating in a mock trial.

PS 240 Legal Bibliography and Resources Credit, 3 semester hours

An introduction to legal bibliographical materials. Students will learn how to use various kinds of law books in solving research problems incident to advising clients and trying and appealing cases. The function of court reports, statutes, codes, digests, citators, loose-leaf services and treatises will be discussed.

PS 315 Political Bureaucracy Credit, 3 semester hours

The nature and function of governmental bureaucratic organizations with particular emphasis on the decision-making process. Attention paid to the sources and consequences of increasing bureaucracy on the ability to govern.

PS 326 Real Estate Law Credit, 3 semester hours

A variety of legal skills in real estate law. Special attention given to title work, mortgage, deeds, leases, property taxes, closing procedures and documents.

PS 328 Legal Management and Administrative Skills

Credit, 3 semester hours

An examination of the procedures and systems necessary to run a law office efficiently. Students will learn such administrative skills as how to interview clients, conduct legal correspondence and maintain legal records. Proven management techniques for keeping track of filing dates and fees, court dockets and calendars also examined.

PS 329 Legal Library Skills Credit, 3 semester hours

A systematic appraisal of the duties, responsibilities and skills required of paraprofessionals employed in law libraries.

PS 330 Legal Investigation Credit, 3 semester hours

Examines skills needed to conduct investigations that are a routine part of the practice of law. How to search a title and how to trace patent rights; principles of fact-gathering in a wide range of cases (e.g., criminal, divorce, custody, housing).

PS 406 Public Affairs Research Credit, 3 semester hours

Students prepare recommendations on policy problems presented to the institute by governmental bodies on the municipal, state and federal levels or by private groups.

PS 415 Internship in Legal and Public Affairs Credit, 3 semester hours

Students will have the opportunity to work as paraprofessionals in law

offices and government agencies, and to share their experiences with other interns in legal and public affairs.

PS 430 Computers and the Law Credit, 3 semester hours

An analysis of the ways in which the advent of the computer has affected law and the legal profession. Students will explore methods of using computers for legal research, the effects of computers on criminology and the administration of justice, the impact of mass data banks on the right to privacy and freedom of choice.

PS 440 Legal Research Credit, 3 semester hours

The purpose of this course is to give the student practical experience in researching and writing on realistic legal problems. Specific written assignments will require students to make use of all the library tools. Students will learn how to prepare and analyze legal memoranda and briefs.

Department of Psychology

Chairman: Professor Dennis M. Courtney, Ph.D., Ohio State University.

Professor: David Brown, M.A., Columbia University

Associate Professors: Robert J. Hoffnung, Ph.D., University of Cincinnati; Arnold Hyman, Ph.D., University of Cincinnati; Thomas L. Mentzer, Ph.D., Brown University; David Paelet, Ph.D., University of Connecticut; Michael York, Ph.D., University of Maryland.

Assistant Professor: Sandhya M. Sood, Ph.D., Cornell University.

Psychology faces the questions that are of most immediate concern to the individual: problems such as personal identity, the social context, normalcy versus deviance and behavior change. As a science, psychology is devoted to the understanding, prediction and control of behavior.

Our dedication to these goals requires that we study behavior from a number of viewpoints — development, learning, social, physio-

logical, abnormal, personality — each fascinating in its own right. The student's attention is also drawn to the many settings in which behavior occurs, from the family to the laboratory, from the clinic to the marketplace. This great diversity ensures that the study of psychology will interrelate meaningfully with other courses in the humanities and sciences.

The undergraduate program in the department of psychology combines basic science and applications to prepare students for further professional training in psychology or for careers in the health professions, law, business, education and human services delivery. Study in psychology is frequently combined with work in other programs at the University of New Haven, particularly those in sociology, political science, social welfare, management, criminal justice and biology. Courses in business and industrial psychology, psychological measurement and consumer behavior are especially useful to students preparing for careers in business or public service.

The psychology major develops skills in design and analysis of research and effective communication through the study of statistics, experimental methods, psychological measurement and psychological theory. Through involvement with behavior therapy and community psychology field work, the student can confront behavior problems in a more direct, practical fashion. The psychology department feels that it is only through a thorough grounding in basic skills and principles that students can effectively realize their own goals.

BEHAVIORAL SCIENCE CLUB

Students in psychology have the opportunity to participate in the Behavioral Science Club. Its purpose is to provide opportunities both to socialize and to develop students' interests in the science and profession of psychology. Throughout the year, the club sponsors guest lecturers and a variety of field trips. All students are welcome to join.

PSI CHI

Membership in the University of New Haven Chapter of Psi Chi, the national honor society, is open to students in the top 35 per cent of their class who have completed at least nine credits of psychology with grades of **B** or better, and who are making the study of psychology one of their major interests.

GRADUATE STUDY IN PSYCHOLOGY

The University of New Haven offers the Master of Arts degree in Community Psychology and Organizational/Industrial Psychology. For descriptions of those programs, see the Graduate School bulletin.

Requirements for the degree Bachelor of Arts with a major in psychology

Major requirements include: Introduction to Psychology, P 111; Statistics for Behavioral Sciences, P 301; Experimental Methods in Psychology, P 305; Social Psychology, P 321; Human Assessment, P 350; and 21 semester hours of advanced psychology courses. Only two, 200-level psychology courses may be counted toward the major. Also required are: General Biology, SC 121; Human Biology, SC 123; Sociology, SO 113; Introduction to Problems of Philosophy, PL 111, or Logic and Scientific Methods, PL 124; and one college-level mathematics course.

Students anticipating graduate study should take Psychological Theory I and II, P 341 and P 342, and should prepare themselves for graduate foreign language requirements.

REQUIREMENTS FOR THE MINOR

The minor in psychology requires 18 semester hours of study in psychology, including: Introduction to Psychology, P 111; Statistics for Behavioral Sciences, P 301; Experimental Methods in Psychology, P 305; and at least two more 300-level psychology electives.

Students in the School of Business Administration may substitute Probability and Statistics, QA 216, for P 301.

Courses in psychology

P 111 Introduction to Psychology Credit, 3 semester hours

Understanding human behavior. Motivation, emotion, learning, personality development, intelligence, as they relate to normal and deviant behavior. Applying psychological knowledge to everyday personal and societal problems.

P 212 Business and Industrial Psychology Credit, 3 semester hours

Prerequisite: P 111. Psychological principles and research as they apply to the problems of working with people in organizations. Analysis of problems and decisions in the use of human resources, including selection and placement, criterion measurement, job design, motivation.

P 216 Psychology of Human Development Credit, 3 semester hours

Prerequisite: P 111. Human development over the life cycle — conception through death; the changing societal and institutional framework; key concepts and theoretical approaches; understanding development through biography; child rearing and socialization here and abroad.

P 220 Consumer Behavior Credit, 3 semester hours

Prerequisite: P 111. Principles and methods of understanding consumer decisions and choices. Internal and external influences on consumer behavior; decision processes; relationship between consumers and both private organizations and public agencies.

P 240 Undergraduate Practicum in Community Psychology Credit, 3 semester hours

Prerequisites: P 111 and prior written consent of the instructor. Introduction to community problems and human needs; dynamics of mental health and human services; techniques of observing, summarizing and recording human interaction; supervised field placement with community agencies and projects. Eight hours of field work and three-hour seminar.

P 251 Behavior Therapies Credit, 3 semester hours

Prerequisite: P 111. Principles of therapeutic behavior management. Alteration of maladaptive behavior patterns in institutional, neighborhood, home, educational and social settings by operant and respondent reinforcement techniques. Habit management in oneself and one's children.

P 301 Statistics for Behavioral Sciences Credit, 3 semester hours

Prerequisite: Any college-level mathematics course. Concepts and assumptions underlying statistical methods essential to design and interpretation of research on human subjects. Fundamental descriptive and inferential methods.

P 305 Experimental Methods in Psychology Credit, 3 semester hours

Corequisite: P 301. Methods of designing and analyzing psychological experiments. The scientific method as applied to psychology. Consideration of research techniques, experimental variables, design problems, data analysis.

P 306 Psychology Laboratory Credit, 3 semester hours

Prerequisite: P 305. Group and individual experiments to be carried out by students. Research techniques for studying learning, motivation, concept formation. Data analysis and report writing.

P 315 Human and Animal Learning Credit, 3 semester hours

Prerequisite: P 111. Different types of human and animal learning. Learning as an adaptive mechanism. Psychological principles underlying learning. Practical applications of learning principles.

P 321 Social Psychology Credit, 3 semester hours. (Same as SO 320.)

Prerequisites: P 111 and SO 113. The interdependence of social organizations and behavior. The interrelationships between role systems and personality; attitude analysis, development and modification; group interaction analysis; social conformity; social class and human behavior.

P 336 Abnormal Psychology Credit, 3 semester hours

Prerequisite: P 111. Psychological and organic factors in personality disorganization and deviant behavior. Psychodynamics and classifications of abnormal behavior. Disorders of childhood, adolescence and old age. Evaluation of therapeutic methods.

P 341 Psychological Theory I Credit, 3 semester hours

Prerequisite: P 111. Contemporary theory in psychology. Emphasis on those theories which have most influenced thinking and research in sensation, perception, learning, motivation, personality.

P 342 Psychological Theory II Credit, 3 semester hours.

Prerequisite: P 111. The historical and systematic roots of psychology from ancient Greece to the twentieth century.

P 350 Human Assessment Credit, 3 semester hours

Prerequisite: P 301. Basic principles of measurement, applied to problems of the construction, administration and interpretation of standardized tests in psychological, educational and industrial settings.

P 361 Physiological Psychology Credit, 3 semester hours

Prerequisites: P 111, and SC 121, 122 or 123. Endocrinological, neural, sensory and response mechanisms involved in learning, motivation, adjustment, emotion and sensation.

P 370 Psychology of Personality Credit, 3 semester hours

Prerequisites: P 111 and junior class standing. Theory and method in the understanding of normal and deviant aspects of personality ; theories of Freud, Jung, Rogers, neo-Freudians and others.

P 599 Independent Study

Credit, 1-3 semester hours per semester with a maximum of 12

Prerequisites: Consent of faculty member and chairman of department. Opportunity for the student under the direction of a faculty member to explore an area of personal interest. The course must be initiated by the student.

Department of Sociology and Social Welfare

Chairman: Associate Professor Walter O. Jewell III, Ph.D., Harvard University.

Professor: Faith H. Eikaas, Ph.D., Syracuse University.

Associate Professor: Alfred Bradshaw, Ph.D., Syracuse University.

Assistant Professors: Allen Sack, Ph.D., Pennsylvania State University; Michael J. Wynne, M.S.S.A., Case Western Reserve.

Sociology provides the student with a quickened awareness of group behavior and expectations. As the youngest of the social sciences, sociology, couched in social philosophy and social criticism, seeks to understand social interaction and its implications.

Although the discipline anticipates a humanistic orientation, it stresses ethical neutrality and regards empirical research as the major means of extending knowledge about man and awakening insight in predicting social indicators. This awareness becomes a useful background for graduate studies in medicine, law, business and politics, as well as sociology itself. The major in sociology is excellent preparation for such related fields as research, governmental service, personnel work, advertising, journalism and industry.

Early in the academic career, students should seek out a departmental advisor who will guide them in a program geared to best serve their particular interests. Course sequences in social planning, social control, organizations, intergroup relations and social environment are among the selections which may be chosen.

Requirements for the degree Bachelor of Arts with a major in sociology

The sociology major must take a total of 33 semester hours, including Sociology, SO 113; either Contemporary Social Problems, SO 114 (offered in the fall semester), or Deviance, SO 214 (offered in the spring semester); Research Methods, SO 250; Social Theory, SO 413 (offered in the spring semester); Undergraduate Seminar, SO 440 (offered in the fall semester); plus one course in statistics. Of the other 15 semester hours, at least nine must be taken at the 300-level or above.

A student may substitute three semester hours of social welfare (SW) credit for Sociology (SO) credit toward the major. SO 231, SO 311 and SO 320 are listed in other departments in the university, but are designated as comparable sociology listings and may be used as credit toward the major.

REQUIREMENTS FOR THE MINOR

A total of 18 semester hours in sociology is required for the minor, including: Sociology, SO 113; Research Methods, SO 250; Social Theory, SO 413; plus three other courses, two of which must be at the 300-level or above. In selecting these three additional courses, the student is encouraged to seek an advisor within the department who will suggest a combination of courses focused on the student's interests and concerns.

CONCENTRATION IN ANTHROPOLOGY

Anthropology provides a broad, cross disciplinary background and socio-cultural experience in the study of man. It is interdisciplinary in scope with overlapping interests in the humanities, social sciences, natural sciences and fine arts. The student, together with his advisor, works out a program tailored to his particular needs and interests. The program will include: Physical Anthropology and Archaeology, SO 220; Cultural Anthropology, SO 221; either Research Seminar, SO 450, or Practicum, SO 501; Genetics, SC 201; and six other courses designated by the student's advisor and the course instructor as having sufficient anthropological content and focus to warrant credit in anthropology. Under advisement courses in political science, public administration, art, music and English as well as sociology may be used to fill these requirements.

Students in anthropology may anticipate working in museums, for philanthropic, governmental or social service organizations as well as going on to graduate school. A broad base such as anthropology provides one with a sound liberal arts core for more specialized backgrounds in the professions — medicine, law, dentistry, veterinary sciences and journalism. Contact the chairman of sociology for an appropriate advisor.

REQUIREMENTS FOR THE MINOR

A minor in anthropology is also possible. This anticipates a total of 18 semester hours in courses designated by the advisor as supporting the anthropological needs and interests of the student. This work will include: Physical Anthropology and Archaeology, SO 220; Cultural Anthropology, SO 221; Research Methods, SO 250, or Research Seminar, SO 450; plus three other courses in the discipline.

Social Welfare

Coordinator: Michael J. Wynne, M.S.S.A., Case Western Reserve.

Modern society has established a wide variety of social welfare programs directed toward enhancing the social functioning of individuals, developing and coordinating community services and improving institutions and processes of constructive social change. Services are classified according to the type of social problem or client group for which they are intended. Thus, there are agencies which deal with mental health problems, medical problems, income maintenance problems, marital discord, disturbed parent-child relationships, specialized services for children or the aged, services to offenders and programs for social action.

The baccalaureate social welfare major is intended to prepare an individual for beginning social work practice in any of the above settings and institutions. Social welfare workers have been assigned heavy responsibilities in various programs through the practice of casework, group work, social treatment, community organization, research, administration and policy development. The baccalaureate program is a generic introduction to all these areas, preparing the individual for a position in the social welfare system. Those intending to continue their

social work education on a master's degree level will find the social welfare major an ideal foundation.

The social welfare major at the University of New Haven is required in the senior year to satisfactorily complete a field placement in a social service agency in the New Haven area. A professional person at the agency trains, supervises and evaluates each student. Seminars are held weekly to facilitate the integration of the theory learned in class and the practice methods used in the field. Such a combination will allow the student to acquire sufficient grounding to make an intelligent choice of method specialization, and simultaneously to gain perspective on major questions and developments occurring in the field and in the profession.

Requirements for the degree Bachelor of Arts with a major in social welfare

The social welfare major must take all of the social welfare courses listed with the exception of Independent Study — a total of 27 semester hours. In addition, a major student is required to take Sociology, SO 113; Research Methods, SO 250; either Elementary Statistics, M 228, or Statistics for Behavioral Sciences, P 301; and either Deviance, SO 214, or Contemporary Social Problems, SO 114. Developmental and abnormal psychology are recommended, but not required.

Other electives should reflect the personal interests and professional goals of the student. Electives should be selected in consultation with an advisor, to whom the student will be assigned after declaring social welfare as a major.

REQUIREMENTS FOR THE MINOR

A total of 18 semester hours in social welfare courses is required for the minor in social welfare. This work must include Introduction to Social Welfare, SW 220; Group Dynamics, SW 340; Methods of Intervention I and II, SW 415-416; and Field Instruction I, SW 401.

Courses in sociology

SO 113 Sociology Credit, 3 semester hours

The role of culture in society, the person and personality; groups and group behavior; institutions; social interaction and social change.

SO 114 Contemporary Social Problems Credit, 3 semester hours

Prerequisite: SO 113. The major problems which confront the present social order, and the methods now in practice or being considered for dealing with these problems.

SO 155 Women in Society Credit, 3 semester hours

An overview of woman's role in the social system. Discussion includes myths and realities of sex differences. Areas covered include analysis of the relationship of women to the economy, the arts, sciences and how these effect the behavior of women in the contemporary world.

SO 214 Deviance Credit, 3 semester hours

Prerequisite: SO 113 or consent of the instructor. (Offered in the spring semester only.) Centered around deviance as a social product. The problematic nature of the stigmatization process is explored in such areas as alcoholism, crime, mental illness and sexual behavior.

SO 218 The Community Credit, 3 semester hours

Prerequisite: SO 113. (Offered odd years in the spring semester only.) The community and its provisions for health, education, recreation, safety and welfare. Theoretical concepts of community, plus ethnographic studies of small-scale human communities, introduce students to fundamental concepts of community.

SO 220 Physical Anthropology and Archaeology Credit, 3 semester hours

An introduction to the study of human evolution and of present physical variations among mankind. Includes geologic time, primate evolution and early man and his culture.

SO 221 Cultural Anthropology Credit, 3 semester hours

A systematic study of the culture of preliterate and modern societies and of cultural change. Includes analyses of religion, economics, language, social and political organization and urbanization.

SO 231 Juvenile Delinquency Credit, 3 semester hours. (Same as CJ 221.)

Prerequisites: SO 113 and P 111. This course is offered as CJ 221 in university schedules. An analysis of delinquent behavior in American society; examination of the theories and social correlates of delinquency, and the socio-legal processes and apparatus for dealing with juvenile delinquency.

SO 250 Research Methods Credit, 3 semester hours

Prerequisite: Sophomore status. The student develops the concepts necessary for selection and formulation of research problems in social science, research design and techniques, analysis and interpretation of research data.

SO 310 Primary Group Interaction Credit, 3 semester hours

Prerequisite: SO 113. Exploration of communication in group process. Building a group and analyzing group structure and interaction; the ways people communicate emotionally and intellectually.

SO 311 Criminology Credit, 3 semester hours. (Same as CJ 311.)

Prerequisites: P 111 and SO 113. An introduction to the principles and concepts of criminology: analysis of the social context of criminal behavior, including a review of criminological theory, the nature and distribution of crime, the sociology of criminal law and the societal reactions to crime and criminals.

SO 312 Marriage and the Family Credit, 3 semester hours

Prerequisite: SO 113. (Offered in the fall semester only.) The structure and function of the family in American society: analysis of social relations within the institution. Factors contributing to its successful functioning and those leading to alienation and social disorganization.

SO 313 Sociology of Sport Credit, 3 semester hours

Prerequisite: SO 113 or consent of the instructor. (Offered in the fall semester only.) A study of the relationships among sport, culture and society. Emphasis is on both amateur and professional sports and their impact on the larger social order. Course will examine sport from a comparative and historical perspective, but will also focus on problems confronting the world of sport in contemporary American society.

SO 315 Social Change Credit, 3 semester hours

Prerequisite: SO 113. (Offered odd years in the spring semester.) only.) Sources, patterns and processes of social change with examination of classical and modern theories of major trends and developments as well as studies of perspectives on microlevels of change in modern society.

SO 318 Political Sociology Credit, 3 semester hours

Prerequisite: SO 113. (Offered even years in the spring semester only.) Concepts, theories and basic issues in the sociological analysis of political systems. Social factors in political attitudes and behavior with emphasis on understanding the functional and dysfunctional aspects of socio-political coordination and conflict.

SO 320 Social Psychology Credit, 3 semester hours. (Same as P 321.)

Prerequisites: P 111 and SO 113. This course is offered as P 321 in university schedules. The interdependence of social organizations and behavior. The interrelationships between role systems and personality; attitude analysis, development and modification; group interaction analysis; social conf mity; social class and human behavior.

SO 321 Social Inequality Credit, 3 semester hours

Prerequisite: SO 113. Organization of social class: status, power and process of social mobility in contemporary society. Social stratification, its functions and dysfunctions, as it relates to the distribution of opportunity, privilege and power in an industrial society.

SO 322 Sociology of Education

Credit, 3 semester hours. (Offered odd years in the spring semester only.)

Effects of education on American society: the organizational structure; major emphasis on the interactive roles of students, teachers and administrators; particular concern with the relationship between education and socio-economic status and problems of organizational change in the American school system.

SO 331 Population and Ecology Credit, 3 semester hours

Prerequisite: SO 113 or permission of instructor. (Offered odd years in the spring semester only.) Societal implications of population changes and trends; impact of man as a social animal upon natural resources; cultural values and social structures, their influence on environmental ethics.

SO 333 Sociology of Aging Credit, 3 semester hours

Prerequisite: SO 113 or consent of instructor. (Offered even years in the fall semester only.) The sociological phenomenon of aging in America. Analysis of problems of age grading and prejudice; demographic components of aging. Systematic review of major theoretical and applied studies; special emphasis on medical and psychological institutionalization and problems of the self-managing old.

SO 337 Human Sexuality Credit, 3 semester hours

Prerequisite: SO 113 or consent of instructor. (Offered even years in the fall semester only.) A scientific study of human sexual behavioral patterns, social class attitudes and cultural myths. Topics include productive systems, conception, sexual attitudes and behavioral patterns, abortion and sexual laws and sexual deviance patterns.

SO 340 Medical Sociology Credit, 3 semester hours

Prerequisite: SO 113 or consent of the instructor. (Offered even years in the spring semester only.) An analysis of a major social institution, the health care field. Emphasis placed on socio-cultural aspects of the field; general overview of the organization and delivery of health care services and the current problems and issues.

SO 390 Sociology of Organizations Credit, 3 semester hours

Prerequisite: SO 113 or consent of the instructor. (Offered even years in the spring semester only.) Classical sociological theories of organization with emphasis on the concepts of bureaucracy, scientific management, human

relations and decision-making theory. The relevance of these ideas to concrete organizational contexts, e.g., civil service, business, social movements and political parties, charitable institutions, hospitals.

SO 400 Ethnic Dynamics Credit, 3 semester hours

Prerequisite: SO 113. (Offered in the fall semester only.) An interdisciplinary analysis of minority groups with particular attention paid to those regional, religious and racial factors that influence interaction. Designed to promote an understanding of subgroup culture.

SO 410 Urban Sociology Credit, 3 semester hours

Prerequisite: SO 113. (Offered in the fall semester only.) The problems of the cities. Residential patterns together with the physical development of cities and redevelopment plans. An examination of groups of people and their environment and the relationship between the two.

SO 413 Social Theory Credit, 3 semester hours

Prerequisite: nine semester hours in sociology. (Offered in the spring semester only.) An analysis of the development of sociology in the nineteenth century with particular emphasis on the theories of Comte, Durkheim, Simmel, Weber, Marx, de Tocqueville and others.

SO 414 Sociology of Occupations and Professions Credit, 3 semester hours

Prerequisite: SO 113 or consent of the instructor. A sociological analysis of the division of labor, occupational groupings, career patterns and professional associations in modern society.

SO 418 Public Opinion and Social Pressure Credit, 3 semester hours

Prerequisites: SO 113, P 111. (Offered even years in the fall semester only.) An intensive analysis of the nature and development of public opinion with particular consideration of the roles, both actual and potential, of communication and influence.

SO 440 Undergraduate Seminar Credit, 3 semster hours

Prerequisite: consent of department chairman. (offered in the fall semester only.) A detailed examination of selected topics in the field of sociology and a critical analysis of pertinent theories with emphasis on modern social thought.

SO 441 Sociology of Death and Suicide Credit, 3 semester hours

Prerequisite: SO 113 or consent of instructor. (offered in the spring semester only.) A confrontation with individual mortality and an academic investigation of primarily suicidal phenomena within a context of crisis intervention.

SO 450 Research Seminar Credit, 3 semester hours

Prerequisites: P 301 or M 228. The student develops and carries out an original research project in social science, reporting this procedure to the class.

SO 501-502 Practicum Credit, 1-6 semester hours

Prerequisite: consent of the department chairman. Field experience in sociology or anthropology. Seminars in conjunction with this experience before off-campus field work is undertaken. Contact during the field work experience and guidance by the mentor provide an opporutnity for understanding group and individual dynamics and their repercussions. Follow-up seminars and a paper are required.

SO 599 Independent Study

Credit, 1-3 semester hours per semester with a maximum of 12

Prerequisites: Consent of instructor and chairman of department. Opportunity for the student, under the direction of a faculty member, to explore an area of personal interest. This course must be initiated by the student.

Courses in social welfare

SW 220 Introduction to Social Welfare Credit, 3 semester hours

Prerequisite: SO 113. An introduction to social welfare services and the field of social work. Included is an overview of various theories currently used in social work practice, and the situations for which they are applicable.

SW 340 Group Dynamics Credit, 3 semester hours

Prerequisites: SO 113, SW 220 or consent of instructor. (Offered in the fall semester only.) The theory of small group functioning, and the manner in which groups affect the behavior, thinking, motivation and adjustment of individuals. Students will participate in a group which studies itself with the purpose of developing awareness of group processes and awareness of one's own functioning in group situations.

SW 350 Social Welfare as a Social Institution I Credit, 3 semester hours

Prerequisite: SW 220. (Offered in the fall semester only.) The background and development of the social services in relation to economic, political and social systems; analysis of the organization and delivery of social services in an industrial society.

SW 351 Social Welfare as a Social Institution II Credit, 3 semester hours

Prerequisite: SW 350. (Offered in the spring semester only.) Analysis of social welfare policies and programs including public assistance, social insurances, urban renewal, anti-poverty programs, revenue sharing and income maintenance.

SW 401-402 Field Instruction I and II Credit, 6 semester hours

Prerequisite: consent of the Coordinator of Social Welfare. (SW 401 offered in the fall semester only; SW 402 offered in the spring semester only.) Supervised experience relevant to specific aspects of social welfare in human service agencies, institutions and organizations at the local, state and federal levels. Seminars to assist students with the integration of theoretical knowledge and field techniques through lectures and class presentations. Students are required to spend eight hours a week in the field.

SW 415-416 Methods of Intervention I and II Credit, 6 semester hours

Prerequisites: SW 350-351. An introduction is given to the generic aspects of social work methods of intervention into various client systems. This involves problem identification, consideration of institutional resources, goal formulation, strategy selection, implementation procedures, evaluation techniques, and policy implications.

SW 475 Issues in Social Work Credit, 3 semester hours

Prerequisite: SW 401. (Offerd in the spring semester only.) Examination of current issues of controversy in the field of social work, including the changing role of social work in the provision of social services, the functions of the baccalaureate social worker and the responsibilities of the social worker being hosted in a non-social-work agency

SW 599 Independent Study

Credit, 1-3 semester hours per semester; maximum of 12

Prerequisite: consent of faculty member and department chairman. Designed to permit the student to pursue original research of personal interest when it is not already available in the curriculum. Must be directed by a faculty member.

Department of Teacher Education

Director: Professor Philip Olgin, Ed.D., Rutgers University.

The university offers a minor in teacher education to those students

who wish to explore teaching as a profession during their undergraduate years and desire to develop an additional area of expertise to reinforce their major field of study.

This service enables such students to broaden their knowledge of neighboring public school systems and to expand their opportunities should they later decide on teaching as a career. Many public servants retire at an early age and can continue an active professional career as teachers in a related field if they are prepared to take advantage of such opportunities.

Many vocational fields require some professional training in teacher education for their training officers and for their administrators, especially in junior college and senior college departments. State certification is usually required only in public school systems supervised by the state department of education.

The teacher education minor offers several advantages to students in all disciplines enrolled in the various schools at the University of New Haven. Students may choose courses in this program for credit toward their bachelor's degree in their major field and enjoy a stimulating and interesting elective course. All of the basic professional courses in this program may be applied toward the State of Connecticut Provisional Teaching Certificate.

These teacher education courses may be incorporated into a graduate school program leading to a master's degree and the permanent teaching certificate in the State of Connecticut.

REQUIREMENTS FOR THE MINOR

A total of 15 semester hours in teacher education courses is required for a minor. In addition, Introduction to Psychology, P 111, is recommended.

Courses in teacher education

ED 225 The Adolescent Student Credit, 3 semester hours

Study of the theory and principles of the development of the adolescent from puberty to maturity. The physical, intellectual, emotional, social and moral growth and development of the adolescent.

ED 324 History and Philosophy of Education Credit, 3 semester hours

A critical study of philosophical ideas and conflicting philosophies of education viewed from historical perspectives and compared with current practices. A major purpose of this course is to develop an objective approach to educational points of view accompanied by discriminating historical research. Implications for contemporary educational practice are reviewed.

ED 346 Directed Observation of the Secondary School

Credit, 3 semester hours

Three periods weekly plus laboratory to be arranged. Structured as a practicum. Directed visits to selected secondary schools. Laboratory field experiences include participation, tutoring, group meetings and individual conferences. Emphasis on the principles and problems of the secondary schools as developed through group and individual laboratory experiences.

ED 447 Teaching in the Secondary School Credit, 3 semester hours

General methods of teaching, problems confronting the inexperienced teacher such as discipline, lesson plans, teaching procedures and techniques, planning assignments, testing, grading, reporting to parents, and co-curricular activities. Procedures are adapted to the major field of the student.

ED 465 The Teaching-Learning Process Credit, 3 semester hours

Psychological principles underlying teaching procedures in the classroom. Application of psychological findings and methods to educational practice; learning, motivation and individual differences as they apply to effective teaching.

Department of World Music

Chairman: Associate Professor Ralf E. Carriuolo, Ph.D., Wesleyan University.

Assistant Professor: Michael G. Kaloyanides, Ph.D., Wesleyan University.

The program in world music is unique. Music is studied as a worldwide phenomenon, not simply as defined in the Western European art tradition. The student is encouraged to view music as a creation of all cultures and civilizations on both the folk and art levels, including our own urban and ethnic subcultures. Exposure to various musics should lead the student to specialization in a particular area as an upperclassman.

Since music is a performing art, the student is expected to reach a satisfactory level of proficiency in either a traditional western instrument or one central to the particular culture in which he chooses to specialize.

Requirements for the degree Bachelor of Arts with a major in world music

Eighteen credits from among Introduction to World Music, MU 112; Introduction to Music Theory, MU 150 and MU 151; Introduction to American Music, MU 198 and MU 199; Analysis and History of European Art Music, MU 201 and MU 202; and Theory and Composition, MU 250 and MU 251; as well as 15 credits in upper-level courses, MU 299 and above, which must include Advanced Performance, MU 416. At least three credits must be earned in Performance, MU 116.

Although the program contains no language requirement, students are urged to acquaint themselves with the language of their areas of concentration.

REQUIREMENTS FOR THE MINOR

Fifteen hours in music courses other than performance are required for the minor. Consult with a member of the music faculty.

Courses in world music

MU 106 Chorus Credit, 1-3 semester hours

Styles of group singing, survey of choral music literature from around the world. Also availabe as an extracurricular activity.

MU 111 Introduction to Music Credit, 3 semester hours

Basic forms and styles of music in the Western World. Music appreciation.

MU 112 Introduction to World Music Credit, 3 semester hours

Non-Western musical styles, their cultures and aesthetics; music of the indigenous cultures of the Americas and the advanced musics of the Near East and Far East; emphasis on India, the Orient, Southeast Asia, Africa and Indonesia.

MU 116 Performance

Credit, 1-8 semester hours; maximum 3 semester hours per semester

Open to all students interested in ensembles or private instruction. Students with adequate scholastic standing may carry this course for credit in addition to a normal program.

MU 150-151 Introduction to Music Theory Credit, 6 semester hours

Fundamentals of music: notation, physical and acoustical foundations; harmony and melody; modality, tonality, atonality; consonance and dissonance; tension; introductory composition; and ear training.

MU 198-199 Introduction to American Music Credit, 6 semester hours

Music of the North American continent from the Puritans to the present day; both European and non-European musical traditions, with emphasis on twentieth century developments.

MU 201-202 Analysis and History of European Art Music

Credit, 6 semester hours

The growth of Western art music from its beginnings to the present day. Analysis of musical masterpeices on a technical and conceptual basis.

MU 250-251 Theory and Composition Credit, 6 semester hours

Investigation of music theory in various parts of the world, including the Western Art Tradition. Exercises in the composition of music within these theoretical constructs. Ear training and keyboard harmony.

MU 299 Problems of Music Credit, 3 semester hours

Music as an art form throughout the world. Music aesthetics and its relationship to the performance and composition of music.

MU 300 Studies in Music I Credit, 3 semester hours

Area studies in music and its parent culture. Cultural theory as related to the music; instruments of the area and their etymologies; performance practices; the social role of music, both art and folk. Areas offered depend on availability of staff: China, Japan, the Near East, the Indian sub-continent, Africa, American Indian, Afro-American, Latin America, the Anglo-Celtic tradition and others.

MU 350 Studies in Music II Credit, 3 semester hours

Area studies in musical forms: their history, evolution, and resultant metamorphoses, performance practices, and extant forms. Areas offered depend upon availability of staff.

MU 416 Advanced Performance Credit, 3 semester hours

Prerequisite: Permission of the department staff and a faculty advisor. Preparation and presentation of an instrumental or vocal performance indicating sufficient proficieney to warrant the awarding of a degree in world music.

MU 500 Seminar in Advanced Research Credit, 3 semester hours

Prerequisite: Permission of the instructor. Bibliographical studies of major world music areas; investigation of current and historical musicological theories, analysis and criticism of musicological area literatures.

MU 550 Studies in Urban Ethnic Music Credit, 3 semester hours

Prerequisite: Permission of the instructor. The music tradition of inner-city ethnic groups; emphasis on the operation of the oral tradition in the preservation of cultural values and customs as evidenced through music. Classroom discussion will be balanced by field research in the urban vicinity.

MU 599 Independent Study

Credit, 1-3 semester hours per semester with a maximum of 12

Opportunity for the student under the direction of a faculty member to explore an area of personal interest. This course must be initiated by the student.

SCHOOL OF BUSINESS ADMINISTRATION

Warren J. Smith, Dean

Master's degree programs

Master of Business Administration
Master of Public Administration
Master of Science in:
  Accounting
  Criminal Justice
  Taxation
Executive Master of Business Administration

Bachelor of Science degree programs

Business Administration
Business Data Processing
Business Economics
Communication
Criminal Justice
  with programs in
  Criminal Justice Administration
  Forensic Science
  Correctional Administration
Finance
Financial Accounting
Hotel Management, Tourism and Travel
International Business
Management Science
Managerial Accounting

Marketing
Operations Management
Personnel Management
Public Administration
Retailing

Associate in Science degree programs

Business Administration
Communication
Criminal Justice
Hotel Management, Tourism and Travel
Retailing

The School of Business Administration offers programs leading to degrees in accounting, business administration, business data processing, communication, criminal justice, economics, finance, hotel management, international business, management science, institutional management, marketing, business/science, operations management, personnel management, public administration, retailing and tourism.

Forty to 60 percent of the course work in these programs is in the arts and sciences to insure a liberal education in addition to a sound preparation for a career in business or administration. The student majoring in business administration may select one of a number of minors in the arts and sciences. This option permits the business student to undertake advanced work in an arts or science discipline. A junior or senior is required to participate in one of the practicums available in the School of Business Administration, such as the Small Business Institute or the New Products and Concepts Laboratory. These experiences introduce the student to the challenges of business realities before graduation.

The Master of Business Administration, Master of Public Administration, Master of Science in Criminal Justice, Master of Science in Accounting and Master of Science in Taxation are primarily professional degree programs in which the major objective is to develop practitioners of business and administration. Many men and women who are enrolled are at the same time employed in various public and private organizations and are working toward their degrees on a part-time basis.

The Executive Master of Business Administration is also offered

by the School of Business Administration. The program is designed to enhance the skills and performance of participating executives through an integrated and complete educational program at the graduate level which leads to the award of a graduate degree.

Minors

The student in the School of Business Administration may select one of the following 24 minors: applied design, biology, chemistry, civil engineering, communication, economics, electrical engineering, English, fashion design, history, history-area studies, interior design, journalism, materials engineering, mathematics, mechanical engineering, philosophy, physics, political science, psychology, public administration, sociology or world music.

With the exception of the prerequisite for the minor that may be required in the core, the student enrolled in the School of Business Administration will not be allowed any more courses than required in the specific minor field. Should he enroll for an extra course in the minor, the course will be treated as excess credit. Though a minor is granted because it offers a concentration within a discipline above the survey level, the business major must maintain as varied a selection of liberal arts courses as may be available to him, exclusive of electives used to fill the minor requirements. Electives that remain after the student has completed his minor must be taken in other disciplines.

Only one minor will be recognized, but a student may change his minor.

Before the end of the sophomore year, a student must select a business major and a minor after consultation with the appropriate chairman or other designated advisor. The degree program for the student's third and fourth years will be prepared in consultation with an advisor. This will involve the selection of electives in addition to the required courses. Any university course may be used as an elective.

Courses offered outside of the School of Business Administration or the Industrial Engineering Department of the School of Engineering consist of not less than 40 percent of all work taken toward graduation. A minimum of 120 semester hours is required for graduation.

Admission Criteria

An applicant for admission to business administration programs must be a graduate of an approved secondary school or the equivalent. While no set program of high school subjects is prescribed, an applicant must meet the standard of the university with respect to the high school

average. Applicants must present 15 acceptable units of satisfactory work, including nine or more units of college preparatory subjects. Satisfactory scores on College Entrance Examination Board Scholastic Aptitude Tests (S.A.T.) or American College Testing (A.C.T.) program tests are required.

Cooperative program in economics

In cooperation with Southern Connecticut State College, students in any program within the School of Business Administration at the University of New Haven may take up to 12 semester hours of advanced courses in economics offered by the Department of Economics at Southern Connecticut State College (S.C.S.C.). The 12 semester hours taken at S.C.S.C. will constitute part of a student's regular work toward a degree at the University of New Haven.

Courses offered by the Department of Economics at Southern Connecticut State College which may be of particular interest to University of New Haven students include urban economics, managerial economics, economics seminar and other advanced economics courses.

University of New Haven students interested in taking courses offered by the Department of Economics at Southern Connecticut State College will be required to register at the University of New Haven with their departmental advisor. During spring and fall registration, faculty advisors and the Office of the Dean of the School of Business Administration will have available the catalog of Southern Connecticut State College and a current schedule of courses offered by its Department of Economics.

Full-time students at the University of New Haven taking one or more courses at Southern Connecticut State College in any semester must register at the University of New Haven and pay the university's current tuition charge for full time day undergraduate students.

Department of Accounting

Chairman: Associate Professor Jeffrey L. Williams, C.P.A., C.M.A.; M.B.A., University of Bridgeport.

Associate Professors: Kai K. Nordlund, D.S.J., New York Law School; Richard Reimer, C.P.A., M.S., Columbia University; Henry Vasileff, Ph.D., University of Toronto.

Assistant Professors: Robert Kravet, C.P.A., M.S., University of Massachusetts; Robert M. Rainish, M.B.A., Bernard M. Baruch College; Anne Rich, C.P.A., C.M.A.; M.B.A., University of Bridgeport; Martin Zern, C.P.A., LL.M., New York University.

Instructor: Lawrence Logan, C.P.A., M.S.B.A., University of Massachusetts.

ACCOUNTING

Accounting continues to be identified by its overall purpose: providing information about economic entities for use by economic decision makers. The study of accounting emphasizes the economic decision-making process as well as the principles and procedures used to produce the information required by decision makers.

Accounting promotes an appreciation for not only the nature of accounting information, but also its use in the complex process of decision making by individuals, business firms and government. The Department of Accounting at the University of New Haven seeks to serve the educational needs of those involved in all areas of accounting, public, private or governmental.

On the graduate level, the Department of Accounting offers programs leading to the Master of Science in Accounting and the Master of Science in Taxation. These programs provide a framework for a general inquiry into current accounting issues. In addition, the programs allow a student to pursue a concentration in financial accounting or managerial accounting.

On the undergraduate level, the bachelor's degree program reflects the requirements of state regulatory boards and those of professional accounting organizations, and is designed to prepare students for professional status as either financial or managerial accountants.

FINANCE

Finance, as an area of study, is designed to promote an analytical appreciation of the financial system and the financial decision-making process in which society through its individuals, business firms and governments, is continually engaged. In particular, the study of finance provides a structured analysis of the financial system and the financial decision-making process as determinants of the economic wealth of the

individual, the business firm and the nation. The study of finance enables the student to pursue the preparation required for a number of financial decision-making positions in government and industry including the entire variety of financial institutions.

Given the broad scope of finance and the financial decision-making process, the Department of Accounting provides a comprehensive offering of courses at both the graduate and undergraduate levels of study. The graduate course offerings may be selected to comprise a concentration in finance by the student pursuing the Master of Business Administration degree. The undergraduate course offerings enable the student seeking the Bachelor of Science to obtain a major in finance by satisfying the following requirements.

Requirements for the degree Bachelor of Science with a major in financial accounting

The financial accounting major is selected by those students wishing to pursue a career in public accounting leading to the Certified Public Accountant (C.P.A.) license. The financial accounting major is required to complete at least 36 semester hours of course work in accounting. In addition to the fundamentals of accounting courses, Introductory Accounting I and II, A 111 and A 112, financial accounting majors are required to complete a sequence of course work in cost and managerial accounting: Cost Accounting I and II, A 223 and A 224; and Advanced Managerial Accounting, A 225.

Also required is a series of courses in financial accounting principles, Intermediate Financial Accounting I and II, A 221 and A 222; and Advanced Financial Accounting I and II, A 331 and A 332; plus course work in taxation, Federal Income Taxation I and II, A 335 and A 336, and Auditing Principles, A 333.

Additional course work in accounting may be selected by the financial accounting major throughout the program of study.

Requirements for the degree Bachelor of Science with a major in managerial accounting

The managerial accounting major is selected by students wishing to pursue a career in private accounting as management accountants including the possible attainment of the Certificate of Management Accounting (C.M.A.). The managerial accounting major is required to

complete at least 33 semester hours of course work in accounting and 12 semester hours in related subjects.

In addition to the fundamental accounting courses, Introductory Accounting I and II, A 111 and A 112, managerial accounting majors are required to complete a series of cost and managerial accounting courses, Cost Accounting I and II, A 223 and A 224; and Advanced Managerial Accounting, A 225; plus a sequence of course work in financial accounting principles, Intermediate Financial Accounting I and II, A 221 and A 222; and Advanced Financial Accounting II, A 332. Course work is also required in taxation, Federal Income Taxation I and II, A 335 and A 336, and Auditing Principles, A 333.

The managerial accounting major is also required to complete course work in economics, Government Regulation of Business, EC 311, and Macroeconomic Analysis, EC 341; in quantitative analysis, Statistics II, QA 333; in financial management, Corporate Financial Management, FI 229; and in management, Advanced Management, MG 350.

Requirements for the degree Bachelor of Science with a major in finance

The finance major is required to complete at least 39 semester hours of course work including 21 in finance, nine in economics, six in accounting and three in quantitative analysis. In addition to the basic principles course, Business Finance, FI 113, the finance major is required to complete a varied selection of 18 semester hours in finance courses as follows: Principles of Real Estate, FI 214; Corporate Financial Management, FI 229; Investment Analysis and Management, FI 230; International Finance, FI 325; Financial Decision Making, FI 341; and Financial Institutions and Capital Markets, FI 345.

These finance courses are coupled with course work in economics, Public Finance, EC 314; Money and Banking, EC 336; and Macroeconomic Analysis, EC 341; plus two courses in accounting, Intermeddiate Financial Accounting I and II, A 221 and A 222, and one quantitative analysis course, Statistics II, QA 333.

Courses in accounting

A 111 Introductory Accounting I Credit, 3 semester hours

Prerequisite to all other courses in accounting. A fundamental examination of the concepts, principles and procedures embodied in the financial accounting system. Emphasis will be placed upon the preparation of financial

statements for service-rendering and merchandising business concerns through the application of financial accounting principles.

A 112 Introductory Accounting II Credit, 3 semester hours

Prerequisite: A 111. An extension of the fundamental examination developed in A 111 to include the application of financial accounting principles to manufacturing business concerns. Additional emphasis will be placed upon an introduction to, and application of, managerial accounting principles for planning and controlling manufactuing operations.

A 221 Intermediate Financial Accounting I Credit, 3 semester hours

Prerequisite: A 112. A rigorous examination of financial accounting theory and practice applicable to the corporate form of business organization. With an emphasis upon reporting corporate financial status and results of operations, the course will include: the principles governing, and the procedures implementing, accounting valuations for revenue, expense, gain, loss, current assets, investments and funds, fixed assets (tangible and intangible), other assets and deferred charges. Throughout, reference is made to the relevant publications of professional accounting societies and associations.

A 222 Intermediate Financial Accounting II Credit, 3 semester hours

Prerequisite: A 221. Continuing the emphasis upon corporate financial reporting established in A 221. The principles and procedures applicable to accounting valuations for current liabilities, long-term liabilities, deferred credits and stockholders equity are examined. Special attention is directed to preparing the statement of changes in financial position. Additional topics include income tax allocation, pensions and leases, accounting changes, price level changes, installment sales and consignments. Throughout, reference is made to the relevant publications of professional accounting societies and associations.

A 223 Cost Accounting I Credit, 3 semester hours

Prerequisite: A 112. An in-depth examination of the financial accounting principles and procedures underlying the determination and reporting of product costs for manufacturing concerns. Emphasis is placed upon the concepts and classifications of product costs (direct material, direct labor and manufacturing overhead), as well as the recording and accumulating of such costs within job order and process cost accounting systems.

A 224 Cost Accounting II Credit, 3 semester hours

Prerequisite: A 223. A continuation of the emphasis on product-cost determination established in A 223, integrated with an examination of accounting systems for managerial planning and control. Topics include budgeting, standard costs, variance analysis, direct costing, cost-volume-profit analysis and joint and by-product costing.

A 225 Advanced Managerial Accounting Credit, 3 semester hours

Prerequisite: A 224. A comprehensive analysis of the uses and behavioral implications of managerial accounting information. Emphasis will be placed upon the economic and motivational impact of internal accounting information for planning and controlling operations. Topics include budgets (capital and operating), performance reports, responsibility accounting (cost, profit and investment centers), transfer-pricing, performance measurement, contribution reporting, pricing methods and relevant costs of decision making.

A 230 Fund Accounting Credit, 3 semester hours

Prerequisite: A 221 or consent of the instructor. An examination of fund accounting principles based upon the most recent pronouncements of the National Committee on Governmental Accounting. The emphasis will be placed on accounting for municipal governments, although accounting for other governmental and not-for-profit entities may be covered at the option of the instructor.

A 331 Advanced Financial Accounting I Credit, 3 semester hours

Prerequisite: A 222. An examination and evaluation of the literature generated by authoritative financial accounting boards to determine its effect on the structure of financial accounting theory, its impact on financial accounting practice and its implications for the future role of the accountant. Extensive use is made of the publications of professional accounting societies and accounting association.

A 332 Advanced Financial Accounting II Credit, 3 semester hours

Prerequisite: A 222. A concentrated examination of financial accounting concepts and the principles and procedures applicable to partnership and consolidation accounting. Partnership topics include: formation and division of income, changes in ownership and liquidation. Consolidation topics include comprehensive coverage of the cost and equity methods, as well as other issues (purchase versus pooling of interests, entity theory, etc.) related to consolidation accounting. Other financial accounting topics of a specialized nature not previously covered may be included at the discretion of the instructor.

A 333 Auditing Principles Credit, 3 semester hours

Prerequisite: A 222. A general examination of the role and function of the independent auditor in the performance of the attest function. Emphasis will be placed on current auditing pronouncements, the audit report, statistical sampling, evaluation of internal control and the determination of the scope of an audit.

A 334 Auditing Procedures Credit, 3 semester hours

Prerequisite: A 333. An examination and evaluation of the detailed procedures associated with auditing accounts related to a firm's financial position, changes in financial position and operating results. An evaluation and

documentation of internal control procedures will be an integral aspect of the evaluation of the fairness of accounting balances. A practical audit case will be used to develop an appreciation for the application of auditing techniques.

A 335 Federal Income Taxation I Credit, 3 semester hours

Prerequisite: A 112. An introduction to the federal income tax laws. Course coverage will be devoted primarily to individual taxation, including determination of gross income and adjusted gross income, capital gains and losses, deductions, exemptions, withholding, estimated tax and tax return preparations.

A 336 Federal Income Taxation II Credit, 3 semester hours

Prerequisite: A 335. A continuation of A 335, including coverage of installment sales, inventory, tax accounting, taxation of corporations and shareholders and tax procedural aspects. A synopsis of Social Security and the Federal Estate Gift Taxes is also presented.

Courses in finance

FI 113 Business Finance Credit, 3 semester hours

Prerequisites: A 112 and EC 133. An introduction to the principles of financial management and the impact of the financial markets and institutions on that managerial function. An analytical emphasis will be placed upon the tools and techniques of the investment, financing and dividend decision. In addition, the institutional aspects of financial markets, including a description of financial instruments, will be developed

FI 214 Principles of Real Estate Credit, 3 semester hours

Prerequisite: FI 113. An introduction to the fundamentals of real estate practice and the essentials of the various aspects of the real estate business. Emphasis will be placed on brokerage, mortgage financing, investments, management and valuation relative to commercial and industrial real estate.

FI 227 Risk and Insurance Credit, 3 semester hours

Prerequisite: FI 113. An examination and evaluation of risk in business affairs and the appropriate methods for handling them from the viewpoint of the business firm. Emphasis will be placed on, and extended consideration devoted to, the various forms of insurance coverage.

FI 229 Corporate Financial Management Credit, 3 semester hours

Prerequisites: FI 113 and QA 216. A comprehensive analysis of the structure of optimal decisions relative to the functional areas of corporate financial decision making. Emphasis is placed upon developing an understanding of the applications and limitations of decision models for the invest-

ment, financing and dividend decisions of the corporation. Topics include: firm valuation, capital budgeting, risk analysis, cost of capital, capital structure and working captial management.

FI 230 Investment Analysis and Management Credit, 3 semester hours

Prerequisites: FI 113 and QA 216. An analysis of the determinants of valuation for common stocks, preferred stocks, bonds, convertible bonds and preferred stock, stock warrants and puts and calls. Emphasis will be placed on the analytical techniques of security analysis, portfolio analysis and portfolio selection.

FI 325 International Finance Credit, 3 semester hours

Prerequisite: FI 113. An introduction to the theory and determination of foreign exchange rates, mechanisms of adjustment to balance of payments disturbance, fixed vs. flexible exchange rates. The international reserve supply mechanism and proposals for reform of the international monetary system.

FI 341 Financial Decision Making Credit, 3 semester hours

Prerequisites: FI 229, FI 230, and QA 333. An examination of the conceptual foundations underlying portfolio theory, capital market theory and firm financial decision making. Emphasis will be placed on an integrated analysis of firm financial decision making under varying conditions of certainty and capital market perfections.

FI 345 Financial Institutions and Capital Markets

Credit, 3 semester hours

Prerequisites: FI 113 and QA 216. An examination of the relationship between the financial system and the level, growth and stability of economic activity. Emphasis will be placed upon the theory, structure and regulation of financial markets and institutions, coupled with the role of capital market yields as the mechanism that allocates savings to economic investment.

Courses in business law

LA 101 Business Law I Credit, 3 semester hours

Contract law as a foundation for anticipating legal difficulties and making the best use of legal advice. Functional and policy problems in the legal resolution of a controversy. The origin and development of common, statutory and constitutional law and of the functioning of the judicial system.

LA 102 Business Law II Credit, 3 semester hours

Prerequisite: LA 102. An advanced study of business law, structured especially for the needs of financial accounting majors. Course coverage will include bailments, property rights, the law of sales and the law of negotiable

instruments. Particular attention will be devoted to applicable provisions of the Uniform Commercial Code. A brief survey of the Federal bankruptcy laws is also included.

LA 103 Business Law III Credit, 3 semester hours

Prerequisite: LA 102. An advanced study of business law, structured especially for the needs of financial accounting majors. Course coverage will include bailments, property rights, the law of sales, and the law of negotiable instruments. Particular attention will be devoted to applicable provisions of the Uniform Commercial Code. A brief survey of the Federal bankruptcy laws is also included.

Department of Communication

Chairman: Assistant Professor Thomas L. Nash, Ph.D., Michigan State University.

Associate Professor: Gilbert L. Whiteman, Ph.D., Michigan State University.

Assistant Professor: Steven A. Raucher, M.S., Brooklyn College.

Words, in and of themselves, have no meaning. Only people have meanings. Given a degree of commonality in our life experiences when words are learned, we strive for understanding. The basis for all human understanding is communication.

The communication programs at the University of New Haven allow students to develop their interpersonal and mass communication skills and awareness through a sequentially patterned series of course offerings.

The programs for communication majors are built around exciting studies designed for students who have a wide range of interests. Whether students envision their future in communication to be that of a television camera person, an on-the-air news broadcaster, a researcher or producer for documentary films or an investigator of why people say what they say and the effects of those utterances on society, it is the department's sincere objective to assist students in attaining their goals.

The Department of Communication works very closely with many local media and with other departments in the university, and enjoys

institutional membership in the National Association of Educational Broadcasters (NAEB) and the Connecticut Broadcasters Association (CBA). Students and faculty have a close liaison with the management and staff of WNHU, the campus FM station. Faculty members and some of the students belong to such professional organizations as the International Communication Association and the professional journalistic society, Sigma Delta Chi. The students of the Department of Communication will soon initiate a local chapter of Alpha Epsilon Rho, the national honorary radio-television fraternity.

Students majoring in communication at the University of New Haven will acquire the professional skills needed to enter the field after earning their undergraduate degrees. The degree programs stress development of the whole person, and allow sufficient flexibility to accommodate any communication major's career objective. Communication is a crucial and challenging responsibility in today's complex society.

The Department of Communication offers two degree programs at the four-year level.

Requirements for the degree Bachelor of Arts or Bachelor of Science with a major in communication

In either degree program, the student majoring in communication at the University of New Haven will have common programs with other communication majors for the first several terms. The initial communication courses introduce the students to the general field of interpersonal and mass communication and the processes involved in the study of human and mass interaction. With this initial orientation complete, the student is then better qualified to make an intelligent choice of major speciality within the department.

The Bachelor of Arts degree program, offered through the School of Arts and Sciences, normally carries a strong minor in journalism. It emphasizes the aesthetic and creative aspects of the major, and travels lightly along technical and production paths.

The Bachelor of Science degree program, offered through the School of Business Administration, emphasizes the production and the technical aspects of film and broadcasting. The student majoring in this program is usually oriented toward programming, production, media management and on-the-air skill development.

The communication major, in either the Bachelor of Science or Bachelor of Arts program, must take at least 30 semester hours of credit in communication (CO) courses. In addition to the most basic course,

Human Communication I, CO 100, which should be taken during the student's first term, all communication majors must complete Fundamentals of Mass Communication, CO 101, and Problems of Mass Communication, CO 102.

The balance of the program, which will depend upon the student's individual orientation and goals, will be determined in individual conferences between the student and an advisor.

REQUIREMENTS FOR THE MINOR

A total of 18 semester hours of communication course credits must be earned in order for a student to declare the field as a completed minor area of study. This work must include Human Communication I, CO 100. The balance of the minor program is worked-out in individual conference with the student and his communication department (minor) advisor.

Requirements for the degree Associate in Science with a major in communication

Upon successful completion of the first two years of the four-year, Bachelor of Science program in communication, students may petition to receive an Associate in Science degree with a major in communication. Students should consult with an advisor for specific information.

Courses in communication

CO 100 Human Communication I Credit, 3 semester hours

The basic course in communication. Objectives are to create within each student an awareness of the omnipresence of communication and the problems surrounding the human communication process.

CO 101 Fundamentals of Mass Communication Credit, 3 semester hours

An introduction to the history of the mass media of newspapers, film, magazines, radio, television, trade publications and public relations.

CO 102 Problems of Mass Communication Credit, 3 semester hours

Examines such problems as the media's impact on society, regulatory control of the media, law and ethics and the behavioral aspects of mass and interpersonal communication. Students examine the variety of media writing and commence writing their own media messages.

CO 206 Sound Workshop Credit, 3 semester hours

Concerned with sound as used in radio, television and film. The course entails lectures, demonstrations and lab practice of sound production and transmission. Laboratory fee

CO 208 Introduction to Broadcasting Credit, 3 semester hours

The student experiences script writing and voice, diction and articulation drills. Coordination with other production team members for dramatic and nondramatic presentations; the place of each member of the team in attaining the broadcast objectives.

CO 210 Film Production Theory and Practice Credit, 3 semester hours

Stresses the understanding of film as a creative form of communication. Basic techniques of motion picture production through lectures, audio-visual activity and small group involvement. Laboratory fee

CO 215 Television Production I Credit, 3 semester hours

Introduction to the mechanics, techniques and aesthetic elements of television production. This course provides the basic grounding in the art and craft of the medium. Laboratory fee

CO 216 Television Production II Credit, 3 semester hours

Prerequisite: CO 215. An intermediate course designed to provide the student with the opportunity to coordinate the many areas of television production. Videotape and live production techniques are employed.

Laboratory fee

CO 220 Film Production I Credit, 3 semester hours

Prerequisite: CO 210. Involves the transformation of an original idea into film: initial analysis, proposed treatment plan, sequencing, film scripting, preproduction planning, nature of the production process. A short film is produced through team effort. Laboratory fee

CO 230 Film Production II Credit, 3 semester hours

Prerequisite: CO 220. The creative process involved in translating advertising copy to film based upon advertising objectives and consumer motivation, appeals and behavior. Involves production of a full-length film by team effort. Laboratory fee

CO 307 Writing for Television and Radio Credit, 3 semester hours

A study of drills and exercises in writing television and radio news, drama, public service announcements, commercials and documentaries. Emphasis is placed on firsthand practical experience assignments and criticism of completed copy.

CO 308 Broadcast Journalism Credit, 3 semester hours

Entails theoretical overview as well as practice in news gathering, editing, writing and use of news services and sources.

CO 315 Advanced Television Production Credit, 3 semester hours

Prerequisite: CO 216. The perfection of techniques acquired in CO 215 and CO 216. Essentials of budgeting, marketing and regulatory policies and rules. Production teams are formed to produce sophisticated local television programs under close supervision. Laboratory fee

CO 402 Practical Problems of Mass Communication

Credit, 3 semester hours

Prerequisites: communication majors only; upper-division standing; consent of the instructor. A seminar examining current problems encountered by various mass media to include print as well as electronic media. Students visit local media managers regularly and receive credit for work with local media to ascertain real-life solutions to media problems.

CO 410 Management Communication Seminar Credit, 3 semester hours

Open to all upper-division students, regardless of major. Involves structure and function of communication in organizations. Practice in understanding and managing interpersonal differences. Emphasizes concepts and principles needed for effective management of organizational communication processes.

CO 415 Television and Radio Station Management

Credit, 3 semester hours

Involves the administrative and personnel problems of television and radio station management; broadcast engineering; local sales; continuity and programming. Discussions will include scheduling and the development of facilities.

CO 599 Independent Study in Communication

Credit, 1-3 semester hours per semester
with a maximum of 6 semester hours

Prerequisite: consent of instructor and chairman of department. Three to six hours are usually reserved for a senior project in communication. Opportunity for the student, under the direction of a faculty member, to explore an area of interest. The course must be initiated by the student. Independent study credits earned in other departments are applied toward the maximum of 6 in communication.

Department of Economics

Chairman: Associate Professor John Teluk, M.A., Free University of Munich.

Professors: Phillip S. Kaplan, Ph.D., The Johns Hopkins University; Joseph A. Parker, Ph.D., University of Oklahoma; Alan Plotnick, Ph.D., University of Pennsylvania; Franklin P. Sherwood, Ph.D., University of Illinois.

Associate Professors: Ahmed Mandour, Ph.D., University of Oklahoma; Geroge Karatzas, Ph.D., New York University; Ward Theilman, Ph.D., University of Illinois.

Assistant Professor: Willard Petersen, M.B.A., Dartmouth College.

Economics courses provide a basis for an understanding of economic structures, a wide range of domestic and international issues and trends in the economic life of modern societies. Economics courses offer training in analysis of economic problems as an aid to the evaluation of economic policies.

Introductory courses are designed to provide the foundation of economic knowledge which every citizen in a modern complex society should have in order to understand the decisions of individual economic units and the operation of a national economy as a whole.

Advanced courses are designed primarily for economics and business majors. They cover in depth specific economic topics. They also attempt to prepare students for economic research and management positions in financial institutions, individual organization, government or graduate study and teaching.

The Department of Economics has two major objectives: to function as a service department for other departments in the School of Business Administration and other schools of the university and to offer a specialized education to students majoring in economics.

The major in economics offers a choice of either a Bachelor of Science in Business Administration or a Bachelor of Arts. The former provides preparation for research or executive positions in business or government. The latter is designed for students planning graduate studies.

The economics major must take at least 24 required semester hours of courses in economics.

Requirements for the degree Bachelor of Science with a major in business economics

The following are the required courses for business economics majors: Principles of Economics I and II, EC 133 and EC 134; Money and Banking, EC 336; Applied Economic Analysis, EC 420; Mathematical Methods in Economics, EC 320; Macroeconomic Analysis, EC 341; Economics of Labor Relations, EC 350; and an elective offered in the economics department.

Requirements for the degree Bachelor of Arts with a major in economics

The following required courses are necessary for the Bachelor of Arts with a major in economics: Principles of Economics I and II, EC 133 and EC 134; Macroeconomic Analysis, EC 341; Economic Thought, EC 442; Microeconomic Analysis, EC 340; Econometrics, EC 410; International Economics, EC 342; and an elective offered by the economics department.

An additional three semester hours will be earned by choosing an elective offered by any other department.

REQUIREMENTS FOR THE MINOR

The following concentration of courses is required for the minor in economics: Principles of Economics I and II, EC 133 and EC 134; Microeconomic Analysis, EC 340; Macroeconomic Analysis, EC 341; and two other courses offered as electives in the Department of Economics selected from among Contemporary Economic Problems, EC 312; Economic Thought, EC 442; Comparative Economic Systems, EC 345; or Probability and Statistics, QA 216.

Courses in economics

EC 133 Principles of Economics I Credit, 3 semester hours

Foundations of economic analysis, including economic progress, resources, technology, private enterprise, profits and the price system. Macroeconomics including national income, employment and economic growth. Price levels, money and banking, the Federal Reserve System, theory of

income, employment and prices, business cycles and problems of monetary, fiscal and stabilization policy.

EC 134 Principles of Economics II Credit, 3 semester hours

Prerequisite: EC 133. Microeconomics including markets and market structure and the allocation of resources. The distribution of income, the public economy, the international economy and the current economic problems.

EC 300 Economic History of the U.S. Credit, 3 semester hours

Development of American economic life in the various stages of agriculture, trade, industry, finance and labor. Change of economic practices and institutions, particularly in business, banking and labor. The changing role of government.

EC 310 Principles of Economic Geography Credit, 3 semester hours

Distribution of resources, industries and population in relation to physical, economic and technological factors. Principles of economic location and regional development.

EC 311 Government Regulation of Business Credit, 3 semester hours

Prerequisites: EC 133, EC 134. An appraisal of public policy toward transportation, trusts, monopolies, public utilities and other forms of government regulation of economic activity.

EC 312 Contemporary Economic Problems Credit, 3 semester hours

The course concerns selected current economic problems; inflation, unemployment, poverty in an affluent society, economic issues in health services, the economics of higher education, current issues in transportation and population. The purpose is to examine and to explore policies to cure these problems.

EC 314 Public Finance and Budgeting Credit, 3 semester hours

Prerequisites: EC 133, EC 134. Theory and practice of public taxation. The budgetary process at all levels of government.

EC 315 Economics of Crime Credit, 3 semester hours

The application of basic economic concepts to such topics as the economic costs of crime, the costs of preventing crime, white collar crime, crimes against property, victimless crimes.

EC 320 Mathematical Methods in Economics Credit, 3 semester hours

Prerequisites: M 115 and M 116; or M 115 and M 127; or QA 118 and QA 128. Applications of various mathematical concepts and techniques in macroeconomic and microeconomic analysis. Special emphasis on the design and interpretation of mathematical models of economic phenomena.

EC 336 Money and Banking Credit, 3 semester hours

Prerequisites: EC 133, EC 134. Nature and function of money, commercial banking system, Federal Reserve System and the Treasury, monetary theory, financial institutions, international financial relationships, history of money and monetary policy in the United States and current problems of monetary policy.

EC 340 Microeconomic Analysis Credit, 3 semester hours

Prerequisites: EC 133, EC 134. Study of the determination of the prices of goods and production factors in a free market economy and the role of prices in the allocation of resources.

EC 341 Macroeconomic Analysis Credit, 3 semester hours

Prerequisites: EC 133, EC 134 and A 111. An investigation of the makeup of the national income and an analysis of the factors that enter into its determination. The roles of consumption, investment, government finance and money influencing national income and output, employment, the price level and rate of growth; policies for economic stability and growth.

EC 342 International Economics Credit, 3 semester hours

Prerequisites: EC 133, EC 134. The role, importance and currents of international commerce; the balance of international payments; foreign exchange and international finance; international trade theory; problems of balance of payments adjustment; trade restrictions; international control of raw materials; economic development and foreign aid.

EC 345 Comparative Economic Systems Credit, 3 semester hours

Prerequisites: EC 133, EC 134. A comparative study of the economic organization, resource allocation and growth problems of the United States, British and French economic systems and the economic systems of the U.S.S.R., Poland and Yugoslavia.

EC 350 Economics of Labor Relations Credit, 3 semester hours

Prerequisites: EC 133, EC 134. History of the union movement in the United States, union structure and government, problems of collective bargaining, economics of the labor market, wage theories, unemployment, governmental policy and control and problems of security.

EC 410 Econometrics Credit, 3 semester hours

Prerequisite: EC 320. The application of mathematical and statistical methods to both micro and macro economic policy issues.

EC 420 Applied Economic Analysis Credit, 3 semester hours

Prerequisites: EC 133, EC 134. A study of applied economics involves application of the tools of economic analysis to the real-life problems of business firms, government agencies and other organizations.

EC 440 Economic Development Credit, 3 semester hours

Prerequisites: EC 133, EC 134. Economic problems of developing countries and the policies necessary to induce growth. Individual projects required.

EC 442 Economic Thought Credit, 3 semester hours

Prerequisites: EC 133, EC 134. The development of economic doctrine from mercantilism and Adam Smith to the thinking of modern-day theorists. Emphasis upon the main currents of thought with the applicability to present-day problems. Individual study and reporting.

EC 450 Thesis Credit, 3 semester hours

A written report on a research project. No class meetings, but periodic conferences with the thesis supervisor.

Department of Hotel Management, Tourism and Travel

Acting Chairman: Assistant Professor John R. Coleman, Ph.D., University of Massachusetts.

Associate Professor: Robert A. Elting, Ph.D., New York University.

Assistant Professors: Francis P. McGee Jr., M.P.A., Syracuse University; Ronald Wentworth, M.S.I.E., University of Massachusetts.

Professionals in hotel management, tourism and travel work in a fast-growing, challenging, exciting and rewarding field. The number of job openings for qualified workers grows daily—from small restaurants or rooming houses to the largest, most modern, busiest resorts or hotel complexes. Places of employment are as varied as the companies, from small towns to major cities, the sea shore to ski country, in the U.S. or abroad.

Many personally and financially rewarding careers are available in the growing field of hotel management. Currently there are about 65,000 hotels and motels in the United States employing more than 700,000 people, figures which keep increasing as more and more people travel.

Tourism is a major national resource for many nations. Travel patterns and transportation often affect the construction and development of new facilities. Most countries and states have major programs designed to expand tourism within their boundaries.

The tourism and travel major studies the growth of the travel industry and the effects of increased leisure time on the industry. The history, routes, equipment and development of national and international carriers are studied along with the application of scientific methods of management to a complex international business.

Requirements for the degree Bachelor of Science with a major in hotel management, tourism and travel

A total of 120 semester hours is required to complete the Bachelor of Science degree, 30 hours of general business courses, 30 hours in the concentration and related fields and approximately 50 percent in liberal arts and the sciences. It is suggested that the student enrolled in hotel management, tourism and travel choose a minor in psychology, sociology, area studies or a foreign language.

REQUIREMENTS FOR THE CONCENTRATION IN HOTEL MANAGEMENT/RESTAURANT MANAGEMENT

This concentration requires 30 hours of study in hotel administration, food and beverage control, front office procedures, properties management, laws of innkeeping and hotel systems and operations. Elective courses such as layout and design and hospitality promotion are also offered. On-the-job training is received through an internship program. Culmination of the program is the Seminar in Hotel Management.

REQUIREMENTS FOR THE CONCENTRATION IN TOURISM AND TRAVEL

In the curriculum, international economics, geography and the social and cultural patterns that have shaped the development of the travel and tourism industry are closely examined. The concentration of 12 semester hours in travel and tourism offers an introduction to the field through the study of cultural tourism, the economic role of tourism and its development, the sociology of tourism and tourism components and supply.

Requirements for the degree Associate in Science with a major in hotel management, tourism and travel

An Associate in Science degree is available to students who successfully complete a two-year curriculum of courses included in the Bachelor of Science degree program. Students wishing to petition for the Associate in Science degree should contact their advisor.

Courses in hotel management, tourism and travel

HM 100 Introduction to the Hotel/Restaurant Business Credit, 3 semester hours

An introduction to hotel and restaurant operation. History of the industry with special emphasis on current trends, analysis of various operations within the industry.

HM 150 Management Decision Making Credit, 3 semester hours

Prerequisite: consent of the instructor. Current methods and principles of food production as practiced in the food service industry. Quality control, portion and cost control, menu planning.

HM 165 Principles of Tourism and Travel Credit, 3 semester hours

An introduction to aspects of tourism related to the hotel-motel industry. Foreign and domestic tourism, business travel.

HM 166 Touristic Geography Credit, 3 semester hours

Prerequisite: HM 165. An examination of the touristic areas of every major travel destination. Travel destinations; current developments worldwide attracting individuals, pleasure groups or business conventions.

HM 210 Hotel Front Office Systems Credit, 3 semester hours

Prerequisite: consent of the instructor. An introduction to the work flow connected with front office procedures. Preparation of the night audit, an introduction to the art of inn-keeping.

HM 212 Laws of Inn-Keeping Credit, 3 semester hours

Prerequisite: HM 104, or consent of the instructor. The historical development of the common inn. Inn-keeper/guest relationships, responsibilities of the inn-keeper, use of the inn-keeper's lien.

HM 267 Shipping and Cruises Credit, 3 semester hours

An analysis of shipping from its earliest developments, including its effects on interregional and international communications. The passenger liner and its emergence as a total vacation entity, the cruise industry and its interrelationship with airlines, hotel and tour operators.

HM 268 Land Transportation and Reservation Procedures
Credit, 3 semester hours

An examination of the effects of rail transportation throughout the world, including migration, trade, travel trends and the development of hotels and resorts in the Americas, Europe, Australia, Africa and the Pacific. Growth of automotive transportation, both coach and automobile; the effect on the scope of world travel patterns.

HM 321 Hotel, Restaurant and Institutional Food Service Accounting and Auditing Procedures Credit, 3 semester hours

Prerequisite: MG 125. Practices and systems of accounting and auditing used in hotels and restaurants including controls, use and interpretation of financial statements. Proper operations, specialized industry procedures.

HM 322 Marketing and Sales Promotion in Hotels, Restaurants and Institutional Food Services Credit, 3 semester hours

Prerequisite: MK 105. An analysis of aspects of the services market with emphasis on consumer behavior. Internal and external stimulation of sales in competitive and noncompetitive markets; vagaries of environmental concept; experimental techniques in industry-sponsored, sales-blitz activities.

HM 325 Food and Labor Cost Controls Credit, 3 semester hours

Current methods and principles of food and beverage storage, service, merchandising and issuing as practiced in the hospitality industry. Menu planning, employee training, advertising and promotion, wine-cellar operation, music and entertainment, pre-cost procedures, payroll analysis covered on a rotating basis.

HM 326 Personnel Management for Hotels, Restaurants and Institutions
Credit, 3 semester hours

Prerequisite: MG 125. The administrative and management practices and techniques of personnel management in the hospitality area.

HM 369 Travel Agency Management Credit, 3 semester hours

A study of the travel business defining the functions of the retail travel agent and the wholesale tour operator. The distinction between the two entities and their interrelationship within the framework of the industry. Also examined is their relationship with the principals of the travel industry and the traveling public.

HM 370 Airline Transportation and Reservation Procedures
Credit, 3 semester hours

A study of the present and future relationships of the airline industry to hotels, steamship lines, railways, automobile/coach companies and tour operators. Role of regulatory agencies, growth and future of the airlines.

HM 375 Travel Agency Administration Credit, 3 semester hours

Prerequisites: HM 267, HM 268, or consent of the instructor. A study of the travel business defining the roles of the retail travel agent and the wholesale tour operator, and examining their relationships within the industry and with the traveling public.

HM 410 Hotel, Restaurant and Institutional Food Service Systems and Operations Credit, 3 semester hours

Prerequisite: consent of the instructor. An analysis and evaluation of hotel systems and operations. Analytical techniques, systems, computer-assisted operations and change-induced problems.

HM 411 Food Service Equipment, Layout and Design
Credit, 3 semester hours

A study of building management stressing the interdependence of planning, construction, equipment, maintenance, personnel and service to the on-premise customer. Layout studies, equipment design, budget estimation.

HM 512 Seminar in Hotel, Restaurant and Institutional Food Service Administration Credit, 3 semester hours

Current topics and developments in the food service and hospitality industries.

HM 599 Independent Study Credit, 3 semester hours

Prerequisite: consent of the department chairman. Independent research projects or other approved phases of independent study.

Department of Marketing

Associate Professors: Satish Chandra, J.S.D., Yale University; John Kakalik, Ph.D., Michigan State University; Bernard Weiner, M.B.A., New York University; Ruth Yanover, M.A., University of Wisconsin.

Assistant Professor: Kevin McCrohan, M.B.A., Baruch College.

MARKETING

Marketing focuses on a set of business activities which control the flow of goods and services from producers to consumers. As such, it is typically viewed as a business discipline. In addition, marketing concepts are widely applied to nonprofit institutions, governmental agencies, political campaigns, hospitals, and various social organizations.

The study of marketing includes both managerial and societal perspectives. Managerial emphasis is placed heavily on the coordination of product, promotion, price and distribution policies. designed to relate the firm to its competitive environment. Societal dimensions include issues in consumer protection, legal and social responsibilities of the firm and analysis of marketing's contribution to the total society.

Individual coursework is primarily designed to prepare majors for a career in business. Students may specialize in such areas as advertising, sales, logistics and marketing research or management.

INTERNATIONAL BUSINESS

International business is an interdisciplinary program which draws on areas of marketing, management, finance and economics in order to develop a multinational perspective on contemporary business opportunities throughout the world. It deals with the problems of developing and adapting business practices to operate within different economies, different political systems and different cultures.

A background in international business prepares the student for careers in both the private and public sectors, as well as in international nonprofit institutions.

RETAILING

A major in retailing offers the student a professional degree which provides a variety of career options, both in design and in retailing. The program combines a concentration in applied design and retail merchandising with a concentration in business core courses. The applied design studies and retailing courses furnish the student with a knowledge of products and the means of merchandising products, while the business core courses prepare the student to exercise the option of pursuing graduate studies in business.

Retailing is a specific career field in the area of marketing technology which offers expanding opportunities to the college graduate, since the selling of goods and the distributing of those goods are key functions in our economy. The curriculum of the retailing major

emphasizes human behavior, design, and aspects of those personal relationships which are important to an endeavor which demands continuous contact with the consumer and the continuous satisfaction of consumer needs.

Requirements for the degree Bachelor of Science with a major in marketing

A minimum of 30 semester hours is required for a marketing major. Principles of Marketing, MK 105; International Business, IB 312; Marketing Management, MK 515; and Marketing Research and Information Systems, MK 442; are required of all majors. The balance of the program consists of six or more additional courses to be selected after consultation with an advisor.

Requirements for the degree Bachelor of Science with a major in international business

The student with a major in international business must complete 27 semester hours of course work including the following courses: International Business, IB 312; International Economics, EC 342; International Marketing Management, MK 413; and Comparative Management, MG 415. Remaining courses are to be selected after consultation with an advisor.

Requirements for the degree Bachelor of Science with a major in retailing

Students with a major in retailing must complete the approved program of courses in the retailing curriculum, including Textiles, RT 212; Retail Credit Management, RT 215; Fashions in Retailing, RT 218; Retail Advertising and Sales Promotion, RT 309; Retail Merchandise Management, RT 310; and Retail Buying, RT 313. It is suggested that retailing majors choose a minor in either interior design or fashion design.

Requirements for the degree Associate in Science with a major in retailing

An Associate in Science degree is available to students who successfully complete a two-year curriculum of courses included in the Bachelor of Science degree program. Students wishing to petition for the Associate in Science degree should contact their advisor.

Courses in marketing

MK 105 Principles of Marketing Credit, 3 semester hours

Prerequisite: EC 133. The fundamental functions of marketing involving the flow of goods and services from producers to consumers. Marketing methods of promotion, pricing, product decisions and distribution channels.

MK 205 Analysis of the Buyer Credit, 3 semester hours

Prerequisite: MK 105. A study of the principle comprehensive marketing models which focus on customer decision processes. Topic include brand switching decisions, measures of media effectiveness and test marketing techniques.

MK 302 Industrial Marketing Credit, 3 semester hours

Prerequisite: MK 105. Practices and policies in the distribution of industrial goods including purchasing, market analysis, channels of distribution, pricing, competitive practices and operating costs.

MK 307 Advertising and Promotion Credit, 3 semester hours

Prerequisite: MK 105. The design, management and evaluation of the various communications programs involved in marketing and public relations.

MK 316 Sales Management Credit, 3 semester hours

Prerequisite: MK 105. The management of a sales organization. Recruiting, selecting, training, supervision and compensation of sales personnel.

MK 413 International Marketing Management Credit, 3 semester hours

Prerequisites: IB 312, MK 105. Applied marketing decision making in international firms. The development of marketing strategy and techniques in foreign markets.

MK 442 Marketing Research and Information Systems

Credit, 3 semester hours

Prerequisite: MK 105, QA 118, junior standing. Research as a component of the marketing information system. Research design, sampling methods, data interpretation and management of the marketing research function.

MK 460 Consumer Protection Credit, 3 semester hours

Prerequisite: junior standing. The socio-legal framework within which consumers make purchase decisions. The focal point of the course is to develop an analytical framework for evaluating the informational needs of consumers and consistent regulatory policies.

MK 470 Business Logistics Credit, 3 semester hours

Prerequisites: MK 105, QA 118, junior standing. The design and administration of systems to control physical product flows. Both spatial and temporal constraints are treated in the development of transportation, warehousing and manufacturing systems.

MK 515 Marketing Management Credit, 3 semester hours

Prerequisites: MK 105, MK 442, senior standing. The analysis, planning and control of the marketing effort within the firm. Emphasis is on case analysis.

Courses in international business

IB 312 International Business Credit, 3 semester hours

Analysis of business environments with special emphasis on similarities and differences among the nations of the world, and views toward developing intercultural managerial effectiveness.

IB 321 Operation of the Multinational Corporation

Credit, 3 semester hours

Specific problems encountered by multinational firms. Topics include investment decisions, planning and control and the social responsibilities of firms in host nations.

IB 549 International Business Policy Credit, 3 semester hours

Prerequisites: MK 413, FI 325, MG 415. Identification and relation of the elements involved in the dynamics of a company and its international environment through case analysis.

Courses in retailing

RT 121 Introduction to Retailing Credit, 3 semester hours

Prerequisite: MK 105. Introductory survey course of the problems and opportunities in the retail distribution field including a basic understanding of buying, selling and promotion of the retail consumer market.

RT 212 Textiles Credit, 3 semester hours

Prerequisite: RT 121. An in-depth study of the technical make-up of fabrics, their design and their application for the future. Emphasis is placed on fabric knowledge interpreted in actual design and production situation.

RT 215 Retail Credit Management Credit, 3 semester hours

Prerequisite: RT 121. An overview of the forces of credit as they apply to stimulating the retailing scene. A philosophical and operational approach to the uses of credit together with the responsibilities and limitations that it imposes on both the grantor and the grantee.

RT 218 Fashions in Retailing Credit, 3 semester hours

Prerequisite: RT 121. The history of fashion design in both apparel and home furnishings with emphasis on the relationship of the past to the present and to the future possibilities of esthetics in merchandise. Emphasis is placed on understanding what has happened so that intelligent evaluations of future events in the area of design may be predicted.

RT 309 Retail Advertising and Sales Promotion Credit, 3 semester hours

Prerequisite: RT 121. Intensive review of techniques of retail sales promotion, including newspaper, magazine, radio, television and direct mail. Great emphasis placed on store imagery and its appropriateness in a variety of marketing situations. Stress is placed on a review of current advertising campaigns by major retail organizations.

RT 310 Retail Merchandise Management Credit, 3 semester hours

Prerequisite: RT 121. A total review of the profit and loss aspect of retailing. The fundamentals of achieving total management performance in the retail field. The central course in the retail curriculum; required of every retailing major.

RT 313 Retail Buying Credit, 3 semester hours

Prerequisite: RT 121. Modern technical evaluation of the highly specialized field of purchasing merchandise for resale at the retail level, including study and evaluation of the differing techniques employed by department stores, chain stores, discount stores and independent merchants. A total review of the techniques of merchandise buying in all product categories.

Department of Management Science

Chairman: Professor Wilfred R. Harricharan, Ph.D., Cornell University.

Associate Professors: Gene Brady, Ph.D., University of Oregon; Irwin Greenberg, Ph.D., New York University; Frank Greenwood, Ph.D., University of California at Los Angeles; Shiv Sawhney, Ph.D., New York University.

Assistant Professors: Frank F. Flaumenhaft, M.B.A., New York University; William Pan. Ph.D., Columbia University; Ronald N. Wentworth, M.S.I.E., University of Massachusetts; Paul M. Zingale, M.A., University of Minnesota.

At a time in history when all of man's systems—governmental, technological, societal, educational, industrial and military as well as business—are becoming more sophisticated and complex, the need for skilled managers has never been greater. As automation frees man from having to deal directly with materials and the computer frees him from the burden of processing data, man is able to direct his energies to supervision, administration, control and planning, the four major functions of management.

The Department of Management Science seeks to provide students with the foundations of knowledge and skill necessary for moving to positions of responsibility in management. The theories and methods of analyzing decisions which are studied prepare students for entry-level jobs, as well as sharpening the skills of those already holding organizational positions. The underlying concept is to combine adequate specialization with the integrative point of view required of the manager.

The Department of Management Science offers degree programs in six areas of specialization: an Associate in Science degree program in business administration, and bachelor of science degree programs in business administration, business data processing, management science, operations management and personnel management.

The Department of Management Science sponsors a student chapter of the Society for the Advancement of Management (SAM) which is open to students interested in the art and science of professional management. The student chapter of SAM provides students and faculty with a professional and social experience that cannot be found in the classroom. Speakers, films, discussion groups and other activities are scheduled and are open to all those interested in attending.

The Institute of Management Sciences (TIMS) is also represented in the department, although no formal campus chapter has been chartered.

BUSINESS ADMINISTRATION

In order to function effectively in a variety of management situations, administrators should be conversant with all major areas of management. Moreover, they should have a thorough understanding of the interrelationships which exist among the different functional groups within organizations. This point of view is essential for managers who are to participate effectively with others in the administrative group and who are to administer activities in their areas of responsibility in the best interests of the entire organization.

BUSINESS DATA PROCESSING

Management use of quantitative methods has been increasingly reinforced by the application of high speed computer technology and techniques in organizations. The advances in simulation, mathematical programming, decision theory and computer control of systems have generated a need for personnel well trained in both the management sciences and the computer and information sciences.

MANAGEMENT SCIENCE

The purpose of this major is to make available to the student a program that combines classical education in organizational management with modern training in quantitative methods. The fundamental assumption on which the program is based is that it is desirable for a student to acquire a knowledge of the content of business and management with literacy and experience in the areas of quantitative techniques.

OPERATIONS MANAGEMENT

The major in operations management develops the management skills required to analyze, design, implement and control operating systems in a variety of organizations, both profit and nonprofit. The curriculum provides the student with a working knowledge of the nature and function of operating systems and emphasizes the use of systems analysis techniques in their management.

PERSONNEL MANAGEMENT

The major responsibility of personnel management is to attract, develop and retain qualified personnel for the organization. The major applies the research of the behavioral and social sciences in manpower planning, personnel selection, compensation motivation, planning adjustment to change and the development of organizational performance. Industrial relations examines the organization of workers and union-management negotiations. Majors in this field study established and developing systems for the resolution of conflict and the building of viable, accommodative relationships between employers and employees. Emphasis is placed upon the interaction of labor, management and the government in establishing wates, hours and conditions of work. The approach is keyed to an institutional analysis of collective manpower problems and issues within an economic and organizational framework.

Requirements for the degree Associate in Science with a major in business administration

Sixty semester hours or required courses in the areas of business and the arts and sciences are necessary for the awarding of the Associate in Science degree. This is the basic course of study upon which the other programs in the Department of Management Science are based.

Requirements for the degree Bachelor of Science with a major in business administration

The Associate in Science program plus 60 additional semester hours of advanced level business courses and electives are required for the Bachelor of Science degree. Students wishing to major in business administration should consult with their advisors to develop specific plans of study for the degree.

Requirements for the degree Bachelor of Science with a major in business data processing

The degree program in business data processing is a unique blend of management science and computer science. One hundred twenty semester hours are required for the degree. Courses in the Associate in Science program plus advanced courses in business and information systems provide a thorough education. Students wishing to major in business data processing should consult with their advisors to develop a specific plan of study for the degree.

Requirements for the degree Bachelor of Science with a major in management science

One hundred twenty hours, consisting of the Associate in Science degree courses plus 60 semester hours of advanced management courses and electives, are required for the Bachelor of Science degree. Advanced work in management consists of case analysis, small group discussions, seminars, simulation exercises ("management games"), and field studies in actual organizations. Students wishing to major in management science should consult with their advisors to develop a specific plan of study for the degree.

Requirements for the degree Bachelor of Science with a major in operations management

One hundred twenty semester hours, consisting of the Associate in Science degree courses plus 60 semester hours of advanced courses in the management sciences, production management and electives, are required for the Bachelor of Science degree. Students wishing to major in operations management should consult with their advisors to develop a specific plan of study for the degree.

Requirements for the degree Bachelor of Science with a major in personnel management

One hundred twenty semester hours, consisting of the Associate in Science degree courses plus 60 semester hours of additional courses at the advanced level in management, industrial engineering, industrial psychology and electives, are required for the Bachelor of Science degree. Students wishing to major in personnel management/industrial relations should consult with their advisors to develop a specific plan of study for the degree.

Courses in management science

MG 125 Management and Organization Credit, 3 semester hours

A study of management systems as they apply to all organizations. Managerial functions, principles of management, quanititative and behavioral aspects of the management process are examined.

MG 200 Business Systems Analysis Credit, 3 semester hours

Prerequisite: junior standing or consent of the instructor. A survey of the use and application of systems analysis to examine problems of both profit and nonprofit business enterprises. Origins of systems analysis, basic concepts and elements of systems and the systems approach.

MG 205 EDP Communication and Documentation

Credit, 3 semester hours

Prerequisite: junior standing or consent of the instructor. Presents the necessary skills to document computer software packages. Comparative review of documentation methods, systems and standards now in use, design and preparation of program and system user manuals.

MG 231 Industrial Relations Credit, 3 semester hours

Prerequisite: junior standing. A survey of the industrial relations and the personnel management systems of an organization through an integrated behavioral, quantitative and systems approach. Manpower Planning/forecasting and information; labor markets; selection and placement; training and development; compensation; leadership; government/employer and labor/management relations.

MG 317 Small Business Management Credit, 3 semester hours

Prerequisite: junior standing. A realistic examination of some of the characteristics, opportunities, risk-taking and decision-making in new business enterprises or self-employment ventures.

MG 324 Development of Managerial Thought Credit, 3 semester hours

Prerequisite: MG 125. In-depth study of the evolution of modern management and organization theory in order to develop a historical perspective of management thought. Research in the field will be analyzed and applied to current practices.

MG 350 Advanced Management Credit, 3 semester hours

Prerequisite: MG 125. A reinforcement of the principles and practices of management and organization theory from MG 125. Application of management practices to the functional areas, the human factor in organizations, current research and readings.

MG 400 Management Planning and Control Systems

Credit, 3 semester hours

Prerequisite: junior standing or consent of the instructor. An examination of current concepts, techniques and working practices necessary to develop and implement a system for management planning and control. Development of tools such as PERT, CPM and other network analysis systems; computer-assisted decision-making.

MG 415 Comparative Management Credit, 3 semester hours

Prerequisites: IB 312, MG 125. An analysis and examination of management and organizational behavior against a background of diversified cultural systems.

MG 449 Independent Study Credit, 3 semester hours

Prerequisite: project, student and faculty director must be approved by the department chairman and the dean of the business school. Independent study on a project of interest to the student under the direction of a faculty member designated by the department chairman.

MG 450-454 Special Studies in Business Credit, 3 semester hours

Prerequisite: junior standing. Special studies in business and public administration. Work may include study and analysis of specific problems within units of business or government and application of theory to those problems, programs of research related to a student's discipline, or special projects. Several sessions may run concurrently.

MG 455 Managerial Effectiveness Credit, 3 semester hours

Prerequisites: MG 350, MG 324. An examination of current prac-

tices used in identifying and developing effective managers. The problems of the managerial environment, approaches used to alleviate these problems, development of organizational and managerial effectiveness.

MG 460 Information Systems for Operations and Management
Credit, 3 semester hours

Prerequisite: junior standing or consent of the instructor. A development of the steps necessary to design and implement an integrated information system which can benefit all levels of management. Analysis of information requirements, design approaches, processing methods, data management, organizational and social implications, planning and control systems, analytical and simulation models.

MG 489 Internship Practicum Credit, 3 semester hours

Prerequisites: senior standing and consent of the department chairman. A monitored field experience in business or industry subject to academic guidance and review.

MG 512 Contemporary Issues in Business and Society
Credit, 3 semester hours

Prerequisite: senior standing. A rigorous examination of competing concepts of the role of business in society. A capstone, integrative course relating the firm to its environment including issues arising from aggregate social, political, legal and economic factors.

MG 515 Management Seminar Credit, 3 semester hours

Prerequisite: MG 455. An introduction to contemporary publications and the findings of research study reports. Analysis, interpretation and determination of impact of publications on the theory and practice of management.

MG 550 Business Policy Credit, 3 semester hours

Prerequisite: senior standing. An examination of organizational policies from the viewpoint of top-level executives, and a development of analytical frameworks for achieving the goals of the total organization. Discussion of cases and development of oral and written skills.

MG 556 Operations Management Credit, 3 semester hours

The design, implementation, operation and control of productive enterprises, whether private or public, profit or nonprofit. Integration of system analysis, management, science, operations research and management, and organizational theory.

MG 560 Business Systems Simulation Credit, 3 semester hours

The design, development and application of computer simulation models as tools of analysis for business, economic and electronic computer systems. Deterministic and stochastic decision models, computer simulation using principally GPSS and DYNAMO languages.

Courses in quantitative analysis

QA 118 Business Mathematics Credit, 3 semester hours

This course emphasizes basic mathematical techniques as they apply to business. Topics include: number systems; fractions and decimals; ratios, proportions, and percentages; functions; discountings, depreciation and depletion; simple and compound interest; investments and bonds; insurance concepts; and taxes.

QA 128 Quantitative Techniques in Management Credit, 3 semester hours

Prerequisite: QA 118. This course places emphasis on more rigorous applications of quantitative techniques in business. Topics include: linear functions, systems of linear equations and inequalities, matrix algebra, graphical linear programming solutions, quadratic functions, exponential and logarithmic functions, probability concepts and probability theory.

QA 216 Probability and Statistics Credit, 3 semester hours

Prerequisite: QA 128 or equivalent. A course in elementary probability and statistical concepts with emphasis on data analysis and presentation, frequency distributions, probability theory, probability distributions, sampling distributions, statistical inference, hypothesis testing, the T, chi-square and F distributions.

QA 250 Quantitative Techniques II Credit, 3 semester hours

Prerequisite: QA 128. A course stressing advanced applications of quantitative techniques for the solution of business problems. Topics include: sequences and limits; differential calculus and applications; integral calculus and applications; linear programming—the simplex algorithm, duality, parametric programming and sensitivity analysis; expectations, decisions and games; discrete and continuous probability distributions; simulation and Monte Carlo techniques.

QA 314 Field Research in Business and Government Credit, 3 semester hours

Prerequisites: MK 105 and QA 128. Methods of determining customer reaction to goods and services offered in the marketplace and to business establishments. Topics include: the nature and role of sampling; characteristics of sampling procedures; design of sample surveys; development of survey designs; procedures used in interviewing, tabulation, data analysis and presentation of research results; and the appraisal of performance to be expected from survey designs.

QA 333 Statistics II Credit, 3 semester hours

Prerequisite: QA 216. A course stressing advanced statistical concepts and statistical methods relating to business. Topics include: regression and correlation, multiple regression, analysis of variance (ANOVA), index numbers, time series analysis, seasonal and cyclical variations and forecasting methods.

Department of Public Administration

Chairman: Assistant Professor Francis P. McGee Jr., M.P.A., Syracuse University.

Assistant Professors: John R. Coleman, Ph.D., University of Massachusetts; Jack Werblow, Ph.D., University of Cincinnati.

The public administration program is designed to prepare students for public service responsibility as government program administrators, civic leaders and managers of private businesses deeply involved in governmental affairs. Stressed are the organization of government services, the behavior of public officials, the manner in which government raises revenue, the nature of public personnel systems, the role of collective bargaining in the public sector, the manner in which decisions on public expenditures are made and public administrative procedures.

An understanding of public administration is also essential for people preparing for careers in law, journalism and every aspect of business. Public administration training can be easily combined with specialized career program at the University of New Haven.

Public administration students are strongly encouraged to systematically develop their public speaking, group discussion and writing skills through specialized instruction and as a part of their regular public administration course requirements.

Requirements for the degree Bachelor of Science with a major in public administration

Public administration majors must take basic courses such as Introduction to Public Administration, PA 101; Collective Bargaining in the Public Sector, PA 408; Public Administration Systems and Procedures, PA 302; and Administrative Law, PA 390. The balance of the program is tailored to the student's particular interests such as urban planning and management, health administration and personnel management.

CONCENTRATIONS

Students majoring in public administration are encouraged to pursue concentrations in one of the following areas: institutional management, health administration, city planning and management, or personnel management.

REQUIREMENTS FOR THE MINOR

The public administration courses referred to as requirements for the major constitute the minor core. This core and two additional public administration courses which the student chooses constitute the minor.

Courses in public administration

PA 101 Introduction to Public Administration Credit, 3 semester hours

The nature of and problems involved in the administration of public services at the Federal, state, regional and local levels.

PA 302 Public Administration Systems and Procedures Credit, 3 semester hours

Stressed are the major staff management functions in government and in nonprofit agencies: planning, budgeting, scheduling and work analysis.

PA 305 Institutional Budgeting and Planning Credit, 3 semester hours

Budgeting as an institutional planning tool, as a cost control device and as a program analysis mechanism is stressed. Attention is given to the salary expense budget, the revenue budget, the capital budget and the cash budget.

PA 307 Urban and Regional Management Credit, 3 semester hours

Methods and analysis of decision-making related to urban and regional problems. Topics include housing, land use, economic development, transportation, pollution, conservation and urban renewal.

PA 308 Health Care Delivery Systems Credit, 3 semester hours

Prerequisites: PA 302 and QA 314. A comparative analysis of health care delivery systems and the application of systems analysis and design concepts for designing and evaluating health care delivery systems.

PA 315 Metropolitan Planning Credit, 3 semester hours

Analysis of demographic data, public expenditures and land-use-control surveys. Land-use controls, planned unit development, the development of

new communities, and urban growth policy are discussed. State and Federal policies affecting urban growth are stressed.

PA 316 Urban Housing Credit, 3 semester hours

Encompassed are the subjects of housing management, planning, finance and policy. Specific topics such as the provision of low-income housing, the use of mortgage insurance, interest subsidies, site planning, rent controls, code enforcement, mortgage markets and the rise in housing abandonment are stressed.

PA 320 Municipal Finance and Budgeting Credit, 3 semester hours

This course involves the analysis of fiscal policy at the municipal level. The financing and budgeting of services and improvements by local government.

PA 390 Administrative Law Credit, 3 semester hours

Suggested prerequisite: PS 332. The basic legal arrangement of administrative organization; rules governing the use of administrative powers; legal procedures for enforcement of executive responsibilities.

PA 405 Public Personnel Practices Credit, 3 semester hours

Study of the civil service systems of the Federal, state and local governments including a systematic review of the methods of recruitment, evaluation, promotion, discipline, control and removal.

PA 408 Collective Bargaining in the Public Sector

Credit, 3 semester hours

Analysis of collective bargaining in the public sector, with emphasis on legislation pertaining to government employees.

PA 449 Independent Study Credit, 3 semester hours

An examination of public health activities, including public health organization, environmental health, disease control, use of information systems and social services.

PA 490 Public Health Administration Credit, 3 semester hours

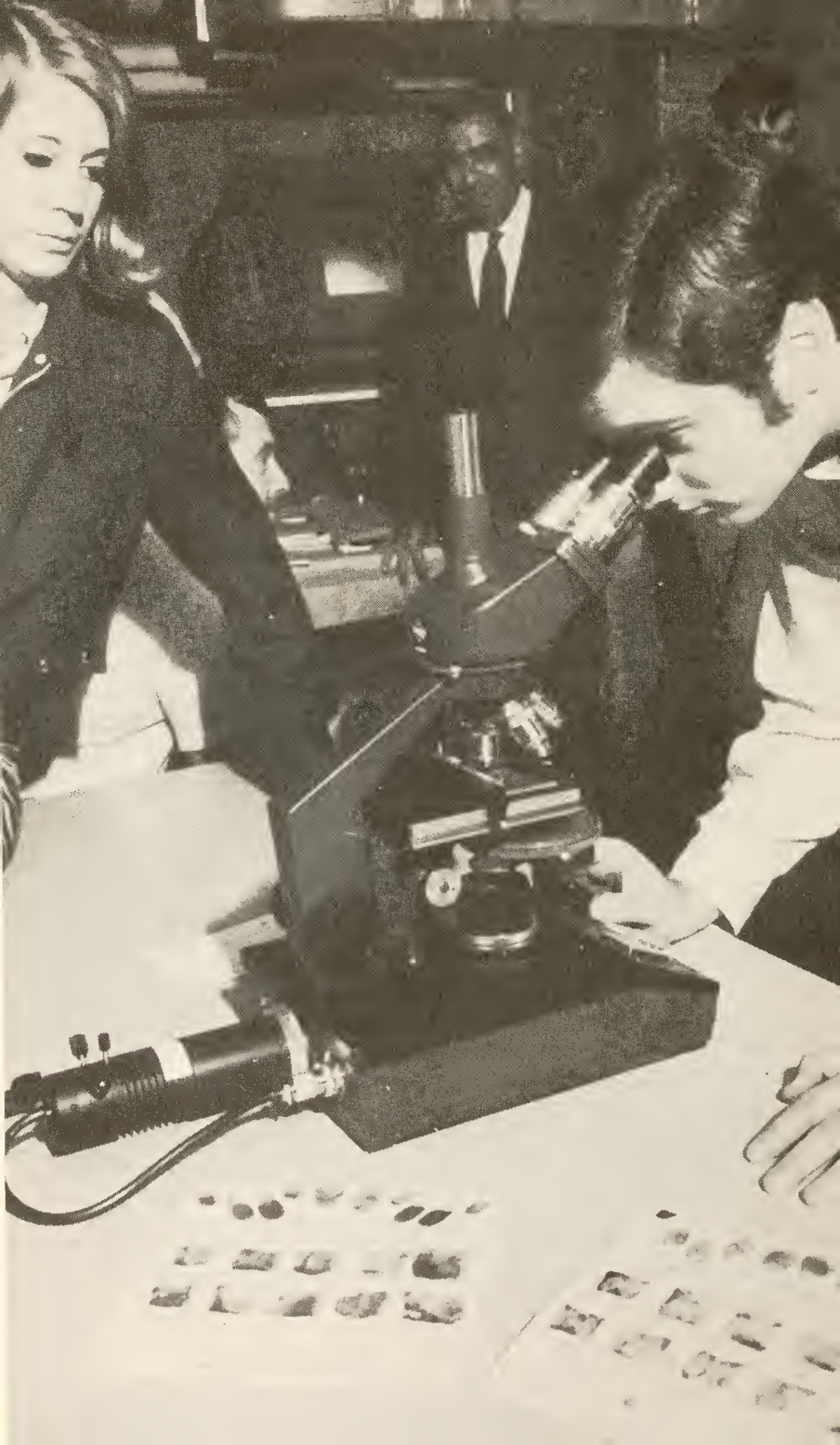
An examination of public health activities, including public health organization, environmental health, disease control, use of information systems and social services.

PA 491 Public Health and Environmental Law Credit, 3 semester hours

The role of the law in public health and environmental protection. Emphasized are the legal tools and administrative techniques used in the enforcement and administration of public health and environmental control policy.

PA 512 Seminar in Public Administration Credit, 3 semester hours

Prerequisite: senior standing. Selected topics related to public administration are chosen.



DIVISION OF CRIMINAL JUSTICE

Robert D. Meier, Director

Master of Science in Forensic Science

Master of Science program in criminal justice with concentrations in:

Social and Behavioral Science
Criminal Justice Institutions
Criminal Justice Systems

Bachelor of Science program in criminal justice with concentrations in:

Law Enforcement
Corrections
Forensic Science

Associate in Science program in criminal justice with concentrations in:

Law Enforcement
Corrections

Division of Criminal Justice

Director: Associate Professor Robert D. Meier, Ph.D., Columbia University

Chairman: Assistant Professor Edwin C. Pearson, LL.M., Harvard University

Director of Forensic Science Program: Assistant Professor Henry C. Lee, Ph.D., New York University

Associate Professors: L. Craig Parker Jr., Ph.D., State University of New York at Buffalo; Gerald D. Robin, Ph.D., University of Pennsylvania

Assistant Professors: Alfred E. Attard, Ph.D., Illinois Institute of Technology; Lutakome A. Kayiira, M.A., State University of New York; Charles A. Maillard, J.D., St. Louis University; Belinda Rodgers, M.A., State University of New York.

The criminal justice system is the formal mechanism of control through which social order is maintained. The study of this system is approached in an interdisciplinary manner involving law, the physical sciences and the social sciences. Through the use of both conventional and innovative techniques, including lectures, written assignments, seminars, workshops, internships, and independent research and study, an attempt is made to provide students with the opportunity to gain a wide variety of insights and experiences.

There is a full range of career opportunities available in criminal justice at the local, state and national levels. Because of its interdisciplinary approach, the study of criminal justice fills the needs of students seeking careers in teaching, research, and law, and of in-service personnel seeking academic and professional advancement.

The Division of Criminal Justice at the University of New Haven offers courses from the associate to the master's level. Complete information about the Master of Science degree in criminal justice is available in the graduate catalog.

Requirements for the degree Bachelor of Science with a major in criminal justice

Completion of the bachelor's degree program in criminal justice requires from 122 to 130 semester hours' work depending upon the concentration chosen. Students choosing the concentration in law enforcement must complete 42 semester hours of specified criminal justice courses. The corrections student must complete 48 semester hours' work. The forensic science major must complete 27 semester hours of specified work. In each program, the remaining required courses are selected to coincide with the specialized needs of each student.

In addition, each concentration contains restricted electives to be chosen in consultation with an advisor. Each concentration has science, mathematics, English, research methods and statistics requirements. Students should inform their advisors of their intended concentration.

REQUIREMENTS FOR THE MINOR

A total of 18 semester hours is required for a criminal justice minor. Students must take Introduction to Criminal Justice, CJ 101, and Criminal Law, CJ 102. The remaining courses will be selected to give the student a cross-sectional view of the criminal justice system while taking into account the student's general program and career objective.

Requirements for the degree Associate in Science with a major in criminal justice

Students who maintain a minimum cumulative quality point ratio of 2.0 for the first two years of the Bachelor of Science degree program in criminal justice with a concentration in either law enforcement or corrections are eligible to receive the Associate in Science degree in criminal justice with that concentration. Interested students should contact their advisor.

Courses in criminal justice

CJ 101 Introduction to Criminal Justice Credit, 3 semester hours

A survey of the structures and processes in the administration of justice. Analysis of the criminal justice sequence including the foundations of criminal law, the elements and procedures of conviction and the various dispositions for convicted offenders.

CJ 102 Criminal Law Credit, 3 semester hours

The scope, purpose and definitions of substantive criminal law: Criminal liability, major elements of statutory and common law offenses (with some reference to the Connecticut Penal Code) and significant defenses.

CJ 104 Introduction to Police and Law Enforcement

Credit, 3 semester hours

A general survey course intended to acquaint the student with major developments and problems in policing. The course will stress the role of police in a pluralistic society from the mid-nineteenth century to the present.

CJ 107 Introduction to Corrections Credit, 3 semester hours

An introduction and overview of the correctional process, with special attention being given to structures, practices and problems of institutional confinement.

CJ 201 Principles of Criminal Investigation

Credit, 3 semester hours

An introduction to criminal investigation in the field. Conducting the crime scene search, interview of witnesses, interrogation of suspects, methods of surveillance and the special techniques employed in particular kinds of investigation.

CJ 205 Interpersonal Relations Credit, 3 semester hours

Interpersonal psychology as it applies to criminal justice. Empirically validated techniques for practice and training. Topics include facilitating communication, role playing, self-disclosure, group dynamics, crisis intervention and behavioral techniques.

CJ 209 Correctional Treatment Programs Credit, 3 semester hours

Various treatment modalities employed in the rehabilitation of offenders. Field visits to various correctional treatment facilities such as half-way houses and community-based treatment programs.

CJ 215 Introduction to Forensic Science Credit, 3 semester hours

A classroom lecture/discussion session and a laboratory period. Topics include the recognition, identification, individualization and evaluation of physical evidence such as hairs, fibers, chemicals, narcotics, blood, semen, glass, soil, fingerprints, documents, firearms and tool marks.

Laboratory Fee

CJ 217 Criminal Procedure I Credit, 3 semester hours

An inquiry into the nature and scope of the U.S. Constitution as it relates to criminal procedures. Areas discussed include the law of search and seizure arrests, confessions and identification.

CJ 218 Criminal Procedure II and Evidence

Credit, 3 semester hours

Legal doctrines employed in controlling the successive stages of the criminal process. Rules of law related to wiretapping and lineups, pretrial decision making, juvenile justice and trial.

CJ 220 Legal Issues in Corrections Credit, 3 semester hours

An examination of the legal foundation of correctional practice and a review of recent judicial decisions which are altering the correctional environment. An analysis of the factors and forces which are creating a climate of significant reform in corrections.

CJ 221 Juvenile Delinquency Credit, 3 semester hours (same as SO 231)

Prerequisites: P 111 and SO 113. An analysis of delinquent behavior in American society: examination of the theories and social correlates of delinquency, and the socio-legal processes and apparatus for dealing with juvenile delinquency.

CJ 300 History of Criminal Justice Credit, 3 semester hours

An introduction to the historical evolution of the criminal justice system in the United States. The development of police, courts and corrections in the United Kingdom and other English-speaking nations will be traced and compared with the American experience.

CJ 301 Group Dynamics in Criminal Justice

Credit, 3 semester hours

Prerequisite: P 111. An analysis of theory and applied methods in the area of group process. Focus on both individual roles and group development as they relate to criminal justice issues. Experiential exercises are included.

CJ 302 Behaviorism: Applications in Criminal Justice

Credit, 3 semester hours

Prerequisite: P 111. An examination of behavioral theory and its application to criminal justice, exploring token economies, aversion therapy, contingency contracting and other techniques. Discussion of practical and ethical issues of behavior modification.

CJ 303-304 Forensic Science Laboratory I and II

Credit, 6 semester hours

Specific examination of topics and laboratory testing procedures introduced in CJ 215. In the classroom, laboratory procedures are outlined and discussed. Identification and individualization of evidence; casting of hairs and fibers for microscopic identification; electrophortic separation of blood enzymes. Laboratory Fee

CJ 309 Probation and Parole Credit, 3 semester hours

Prerequisite: junior status. An in-depth analysis of probation, parole and varied alternatives to imprisonment: examination of findings of evaluative research on probation and parole and results with current and experimental noninstitutional correctional programs.

CJ 311 Criminology Credit, 3 semester hours

An examination of principles and concepts of criminal behavior; criminological theory; the nature, extent and distribution of crime; legal and societal reaction to crime.

CJ 400 Criminal Justice Problems Seminar Credit, 3 semester hours

Prerequisite: junior status. An examination of theoretical and philosophical issues affecting the administration of justice: the problems of reconciling legal and theoretical ideals in various sectors of the criminal justice system with the realities of practice.

CJ 402 Police/Community Relations Credit, 3 semester hours

Prerequisite: SO 113. An examination of the police and community from a broad theoretical context. Sociological and environmental implications are examined. Attention is given to police practices which have caused much public hostility and which have isolated law enforcement from the community.

CJ 405-407 Seminar in Criminal Justice Credit, 3 semester hours

Prerequisite: senior status. An intensive analysis of variable topics of critical relevance in the administration of justice: a seminar exposing the student to a concentrated learning experience conducive to acquiring special expertise in a specific academic area.

CJ 408 Correctional Counseling Credit, 3 semester hours

Prerequisite: Junior status required. Fundamental psychological counseling theory as it applies to treatment of offenders.

CJ 498 Research Project Credit, 3 semester hours

Prerequisite: Consent of the department chairman. The student carries out an original research project in a criminal justice setting and reports the findings.

CJ 499 Independent Study

Credit, 1-3 semester hours per semester with a maximum of 12

Prerequisite: Consent of the department chairman. An opportunity for the student, under the direction of a faculty member, to explore and acquire competence in a special area of interest.

CJ 501 Criminal Justice Internship Credit, 3 semester hours

Prerequisite: Consent of the department chairman. This program provides monitored field experience with selected Federal, state or local criminal justice agencies or forensic science laboratories subject to academic guidance and review.

SCHOOL OF ENGINEERING

Konstantine C. Lambrakis, Ph.D., Dean

Master of Science degree

Majors in:
- Engineering
- Electrical Engineering
- Environmental Engineering
- Industrial Engineering
- Operations Research
- Computer and Information Science

Bachelor of Science degree

Majors in:
- Civil Engineering
- Electrical Engineering
- Industrial Engineering
- Materials Engineering
- Mechanical Engineering
- Computer Technology

Associate in Science degree

Majors in:
- Engineering
- Aeronautical Technology

From the time of Prometheus, who stole fire from the gods to provide humans with a new tool, society has looked to engineers and applied scientists to provide solutions for problems involving improvement of the quality of life, easing the burden of manual labor and satisfying the human curiosity about things unimaginably small and unbelievably large.

The continuously increasing complexity of technology and the need to match the earth's dwindling resources to the needs of a growing urban society demand an ever-increasing number of engineers of very rigorous training. An engineer capable of meeting the challenges of the future may look forward to an exciting and rewarding career.

Because of its broad science and mathematical basis, the typical undergraduate engineering curriculum provides an excellent preparation not only for an engineering career but also for careers or advanced work in other fields such as law, business or medicine.

The School of Engineering at the University of New Haven offers both extensive facilities and well-trained faculty to meet the challenge of this rapidly changing field. Close ties with business and industry are maintained for the purpose of constantly assessing their needs and of providing the necessary feedback relative to current professional practices.

Although most of the courses in the curriculum are technological or scientific in nature, particular care is given to the cultural and literary education of the students. Among the required courses are courses in literature, composition, history and philosophy.

ASSOCIATE IN SCIENCE

The associate's degree provides students with formal recognition of having completed approximately half of the standard four-year engineering program. Students planning to acquire an associate's degree must consult with the appropriate department chairman early in their studies to devise an acceptable sequence of courses leading to that degree. Many students continue their studies to completion of the requirements for a bachelor's degree.

Admission criteria

An applicant for admission to the engineering programs should be a graduate of a secondary school of approved standing and should present 15 acceptable units of secondary school work. These should include four units of English, two units of algebra, one of plane geometry, one half of trigonometry and one unit each of physics and a second science. Deficiencies in English, mathematics and science may

be satisfied by summer school attendance, or by an extension of the stated curriculum for one or two semesters chosen to fit the student's need.

Satisfactory placement in the Scholastic Aptitude Test (S.A.T.) in mathematics and English as given by the College Entrance Examination Board, or satisfactory placement in the American College Testing (A.C.T.) program is required.

Professional accreditation

The curricula leading to the bachelor's degree in civil, electrical, industrial and mechanical engineering are accredited by the Engineers' Council for Professional Development (E.C.P.D.).

Bachelor of Science programs
Core freshman year

The bachelor of science program in the various engineering majors contains a common freshman year with minor variations in the sophomore year. Students in engineering should choose their major by the beginning of the sophomore year. Students who are accepted with deficiencies must remove them before entering the sophomore year.

The program of study for the freshman year of engineering includes the following: English Composition, E 105; Composition and Literature, E 110; Pre-Calculus Mathematics, M 115; and Calculus I, M 117, or M 117 and Calculus II, M 118, for those students sufficiently prepared; History of Science, MS 121; Introduction to Engineering, ES 107; Introduction to Computers: FORTRAN, IE 102; Mechanics, Heat and Waves with laboratory, PH 150; General Chemistry I with laboratory CH 105; General Chemistry II with laboratory, CH 106; and Physical Education I and II, PE 111-112, or Leisure Living, PE 100.

Department of Civil and Environmental Engineering

Chairman: Associate Professor Ross M. Lanius Jr., M.S., University of Connecticut; Professional Engineer, Connecticut, New Jersey.

Professors: Richard A. Mann, Ph.D.; University of Wisconsin; Professional Engineer, Wisconsin. John C. Martin, M.E., Yale University; Professional Engineer, Connecticut, Colorado, New York, Pennsylvania, North Carolina.

Associate Professors: M. Hamdy Bechir, Sc.D., Massachusetts Institute of Technology; Professional Engineer, Connecticut, Massachusetts, New Hampshire, Vermont, Oklahoma. George R. Carson, M.S.C.E., Columbia University; Professional Engineer, Connecticut, Massachusetts, New York, New Jersey; Landscape Architect, Connecticut; Land Surveyor, Massachusetts, Connecticut.

Civil engineering deals with planning, designing and constructing facilities serving mankind. These services are diversified and include the reduction of air and water pollution; transportation of man, materials and power; renewal of older sections of cities; development of new communities and development of water supply and power lines, railroads and tunnels; all with the least disturbance to the environment.

A civil engineer must have a solid background in math, basic science, communication skills, engineering science, engineering design and humanities. The curriculum is designed to meet these basic criteria.

The first two years are essentially common to all engineering disciplines and include math, basic sciences and communication skills. The junior year is common to all civil engineers and provides a basic background in engineering science. In the senior year, concentrated engineering design courses are available in the environmental, structural, surveying and transportation fields. Through the senior project and independent study, an in-depth study of a specialized field is available. Humanities are included at all levels. The curriculum is accredited by the Engineers' Council for Professional Development.

There is a student chapter of the American Society of Civil Engineers at the university. The chapter sponsors technical lectures, field trips and social activities.

Requirement for the degree Bachelor of Science in Civil Engineering

A total of 132 credits is required for the Bachelor of Science degree in Civil Engineering. The freshman year curriculum is common

to all engineering disciplines and has been stated previously.

Required courses include: Calculus II, M 118; Calculus III, M 203; Differential Equations, M 204; a technical elective in an advanced mathematics course; Electromagnetism and Optics with laboratory, PH 205; Engineering Economics, IE 204; Principles of Economics I, EC 133; and Basic Circuits/Numerical Methods, EE 201.

Mechanical engineering courses required: Engineering Graphics, ME 101; Dynamics, ME 204; and Thermodynamics I, ME 301.

Civil engineering courses required: Statics, CE 201; Strength of Materials I, CE 202; Elementary Surveying, CE 203; Transportation Engineering, CE 301; Building Construction, CE 302; Structural Analysis, CE 312; Soil Mechanics, CE 304; Hydraulics, CE 306; Environmental Engineering and Sanitation, CE 315; Structural Design Fundamentals, CE 317; Civil Engineering Laboratory, CE 319; Contracts and Specifications, CE 407; and Senior Project, CE 501.

Also required are one science elective, one English literature elective, two humanities or social sciences electives, three technical electives and one free elective.

REQUIREMENTS FOR THE MINOR

A total of 18 semester hours of work in civil engineering is required for a minor in civil engineering.

The following are required courses: Elementary Surveying, CE 203; Transportation Engineering, CE 301; Building Construction, CE 302; Environmental Engineering and Sanitation, CE 315; City Planning, CE 403; and Contracts and Specifications, CE 407.

Engineering majors may substitute other civil engineering courses for a minor.

Courses in civil engineering

CE 201 Statics Credit, 3 semester hours

Prerequisites: PH 150 and M 118 (M 118 may be taken concurrently). Composition and resolution of forces in two and three dimensions. Equilibrium of forces in stationary systems. Analysis of trusses. Centroids and second moments of areas, distributed forces, friction, shear and bending moment diagrams.

CE 202 Strength of Materials Credit, 3 semester hours

Prerequisite: CE 201. Elastic behavior of structural elements under axial, flexural, and torsional loading. Stress in and deformation of members, including beams. Lectures supplemented with laboratory demonstrations.

CE 203 Elementary Surveying Credit, 3 semester hours

Theory and practice of surveying measurements using tape, level and transit. Field practice in traverse surveys and leveling. Traverse adjustment and area computations. Adjustment of instruments, error analysis.

Laboratory Fee

CE 205 Statics and Strength of Materials Credit, 4 semester hours

Prerequisites: PH 150 and M 118 (M 118 may be take concurrently). Composition and resolution of forces. Equilibrium. Centroids and centers of gravity. Friction. Trusses and frames. Stress and strain in axial loading, torsion, and bending.

CE 301 Transportation Engineering Credit, 3 semester hours

A study of planning, design and construction of transportation systems including highways, airports, railroads, rapid transit systems, and waterways.

CE 302 Building Construction Credit, 3 semester hours

Introduction to the legal, economic, architectural, structural, mechanical, and electrical aspects of building construction. Principles of site planning, drawing and specification preparation, and cost estimating.

CE 304 Soil Mechanics Credit, 3 semester hours

Prerequisites: M 203 and CE 202. Geological processes of soil formation. Soil classifications. Physical properties are related to the principles underlying the potential behavior of soils subjected to various loading conditions. Methods of subsurface exploration. Laboratory demonstrations.

CE 305 Highway Engineering Credit, 3 semester hours

Prerequisite: CE 301 or consent of instructor. Highway economics and financing. Study of highway planning, geometric design, and capacity. Pavement and drainage design.

CE 306 Hydraulics Credit, 3 semester hours.

Prerequisite: ME 204. The mechanics of fluids and fluid flow. Fluid statics, laminar and turbulent flow. Impulse and momentum. Flow in pipes and open channels. Orifices and weirs.

CE 309 Structural Design—Timber Credit, 1½ semester hours

Prerequisite: CE 202. Study of the structure of wood and its growth, preservation and fire protection. The analysis and design of structural members of timber including columns, beams, tension members, trusses and connections.

CE 310 Structural Design—Masonry Credit, 1½ semester hours

Prerequisite: CE 202. The structural design and analysis of brick

and concrete masonry structures, including unreinforced and reinforced load bearing walls.

CE 311 Structural Design — Timber and Masonry Credit, 3 semester hours
Prerequisite: CE 202. This is a combination of CE 309 and CE 310.

CE 312 Structural Analysis Credit, 3 semester hours
Prerequisites: CE 202, IE 102 and ME 204 (may be taken concurrently). Basic structural engineering topics on the analysis of design of structures. Topics include load criteria and influence lines; force and deflection analysis of beams and trusses; analysis of indeterminate structures by approximate methods, superposition and moment distribution. Framing systems of existing structures are studied.

CE 315 Environmental Engineering and Sanitation
Credit, 3 semester hours.
Introduction into hydrology; population and water demand projections; water and wastewater transport systems. Problems concerning public health, water and wastewater treatment, solid waste disposal, air pollution, and private water supply and sanitary disposal systems.

CE 316 Code Indoctrination Credit, 3 semester hours
Study of codes and regulations prepared and enacted for the public and employee safety along with codes and regulations implemented to develop a uniform and balanced land development and usage program. Health codes, labor laws, zoning regulations, planning regulations and wetlands regulations are discussed.

CE 317 Structural Design Fundamentals Credit, 3 semester hours
Prerequisites: CE 312, which may be taken concurrently, or consent of the instructor, and IE 102. Fundamentals of structural behavior of members, connections and structural systems of steel and concrete. Effect on members of a variety of loading conditions varying from dead load through overloads producing failure.

CE 318 Route Surveying Credit, 3 semester hours
Prerequisite: CE 203. A continuation of elementary surveying covering principles of route surveying, stadia surveys, triangulation, trilateration, practical astronomy, aerial photography, adjustment of instruments. Field problems related to classwork and computer application to surveying problems.

CE 319 Civil Engineering Laboratory Credit, 3 semester hours
Prerequisite: Second semester junior status. Experiments and labora-

tory investigations covering the fields of steel, concrete, soils water and non-destructive testing. Emphasis placed on organization, representative sampling, testing technique, sources of error and presentation of data.
Laboratory Fee

CE 320 Civil Engineering Practice Credit, 1 semester hour

Prerequisite: Second semester junior or first semester senior status. Students are exposed to the phase of actual engineering projects by visiting an engineering office during the semester on a regular schedule.

CE 401 Foundation Design and Construction

Credit, 3 semester hours

Prerequisite: CE 304 or consent of the instructor. Application of soil mechanics to foundation design, stability, settlement. Selection of foundation type—shallow footings, deep foundations, pile foundations, mat foundations. Subsurface exploration.

CE 402 Water Resources Engineering Credit, 3 semester hours

Prerequisites: CE 306 and CE 315. Study of principles of water resources engineering including surface and ground water hydrology. Design of water supply, flood control and hydroelectric reservoirs. Hydraulics and design of water supply distribution and drainage collection systems including pump and turbine design. Principles of probability concepts in the design of hydraulic structures. General review of water and pollution control laws.

CE 403 City Planning Credit, 3 semester hours

Engineering, social, economic, political and legal aspects of city planning. Emphasis placed on case studies of communities in Connecticut. Zoning. Principles and policies of redevelopment.

CE 404 Sanitary Engineering Credit, 3 semester hours

Prerequisites: CE 306 and CE 315. Study of physical, chemical and biological aspects of water quality and pollution control. Study of unit processes and operations of water and waste water treatment including industrial waste and sludge processing. Design of water treatment and sewage treatment systems including sludge treatment and incineration.

CE 405 Indeterminate Structures Credit, 3 semester hours

Prerequisite: ME 307 or CE 312; IE 102 and ME 204. The analysis of statically indeterminate structures. Topics include approximate methods, moment distribution, conjugate beam, energy methods, influence lines and an introduction to matrix methods.

CE 407 Contracts and Specifications Credit, 3 semester hours

Principles of contract formation, execution and termination. Study of specifications and practice in their preparation. Other legal matters of importance to engineers.

CE 408 Steel Design and Construction Credit, 3 semester hours

Prerequisite: CE 317. Analysis, design and construction of steel structures. Topics include tension, compression and flexural members; connections; members subjected to torsion; fabrication, erection and shop practice.

CE 409 Concrete Design and Construction

Credit, 3 semester hours

Prerequisite: CE 317. Analysis and design of reinforced concrete beams, columns, slabs, footings, retaining walls. Basic principles of prestressed and precast concrete. Fundamentals of engineering drawings.

CE 410 Land Surveying Credit, 3 semester hours

Prerequisite: Consent of instructor. A study of boundary control and legal aspects of land surveying, including deed research, evidence of boundary location, deed description and riparian rights. Theory of measurement and errors, position precision.

CE 501 Senior Project Credit, 3 semester hours

Prerequisite: senior status. Supervised individual or group project. The project may be the preparation of a set of contract documents for the construction of a civil engineering facility, research work with a report, or a project approved by the faculty advisor.

CE 599 Independent Study Credit, 1-3 semester hours

Prerequisites: consent of instructor and chairman of department. Opportunity for the student to explore an area of interest under the direction of a faculty member. Course must be initiated by the student, and have the approval of the faculty advisor and chairman.

Department of Electrical Engineering

Chairman: Professor Gerald J. Kirwin, Ph.D., Syracuse University.

Associate Professors: Daniel O'Keefe, Ph.D., Worcester Polytechnic Institute; Stephen Grodzinsky, Ph.D., University of Illinois; Kantilal K. Surti, Ph.D., University of Connecticut.

Assistant Professor: Darrell W. Horning, Ph.D., University of Illinois.

Electrical engineering is fundamentally concerned with energy and information. The principles of electrical phenomena are applied to the generation, distribution and control of energy. Information systems, including computers, radio and television communications systems, as well as apparatus for data processing, are a result of the application of electrical phenomena to specific tasks. Examples abound of both of these activities and include the nuclear power plant, the high voltage transmission line, the automated manufacturing plant, the digital computer and the satellite communications system.

The principal function of the graduate electrical engineer is to design apparatus and systems. He often develops new concepts and procedures by applying well-established design principles to new situations or by the discovery of basic phenomena having immediate technological application. There are many instances in which a whole new technology has resulted from a successful research effort. The electronic hand calculator, for example, is the result of design and fabrication techniques that have been developed only within the recent past. The integrated circuitry in the hand calculator is equivalent to tens of thousands of discrete transistors.

An undergraduate program in electrical engineering must prepare the student for a professional career that will extend over a time span in excess of 40 years after graduation. Consequently, in a field where new developments occur at a continuous and rapid rate, it is imperative that the new graduate be thoroughly trained in basic principles which do not change and which form the foundation of electrical engineering. The program of studies at the University of New Haven includes a balanced concentration on basic engineering analysis and design principles. Modern applications of these techniques are presented in laboratory and design courses. Since the origins of engineering methods are based in the sciences of chemistry, mathematics and physics, courses in these areas are an important part of the program.

The digital computer is of great importance in engineering for analysis and design. Electrical engineering students become competent in the use of computers for numerical applications and optimizing engineering design. The computer is also studied as an element in a system where it is used to monitor and control complex industrial processes.

Electrical engineering students have direct access to the department computer laboratory which presently includes a Digital Equipment Corporation DEC lab 11/10D computer system.

Electrical engineering students should possess good analytical abilities including sound mathematical competence. They should also have a natural curiosity about the multitude of technical devices encountered in everyday life, a willingness to learn the principles that make these devices possible and a desire to create new devices and methods of solving problems.

The Electrical Engineering Department has an active student secton of the Institute of Electrical and Electronics Engineers (IEEE). This organization sponsors visiting lecturers and field trips to surrounding industrial sites. Eta Kappa Nu, the national honorary society for electrical engineers, has the Zeta Rho Chapter at the university to honor superior students and to encourage high scholastic achievements.

Requirements for the degree Bachelor of Science in Electrical Engineering

A total of 126 to 130 credits are required for the Bachelor of Science in Electrical Engineering degree. The freshman year curriculum is common to all engineering disciplines and has been stated previously.

Required courses include the following: in mathematics, Calculus II, M 118; Calculus III, M 203; Differential Equations, M 204; and one mathematics elective in an advanced course; The Western Tradition in Literature II, E 202; Electromagnetism and Optics with Laboratory, PH 205; Statics and Strength of Materials, CE 205; Dynamics, ME 204; Principles of Economics I, EC 133; and Engineering Economics, IE 204.

The following electrical engineering courses are required: Basic Circuits/Numerical Methods, EE 201; Network Analysis I, EE 202; Electrical Engineering Laboratory I and II, EE 253 and EE 349; Network Analysis II, EE 301; Electronics I and II, EE 347 and EE 348; Digital Systems I, EE 355; Electromagnetic Theory, EE 361; Systems Analysis, EE 302; Electromechanical Energy Conversion, EE 363; Statistical Systems Analysis, EE 420; Electrical Engineering Laboratory III, EE 453; and Electromagnetic Waves, EE 462.

Electives required for graduation are: one elective in physics, two electives from the humanities or social sciences, one free elective and four technical electives.

Humanities or social science electives must be selected from American studies, art, economics, English, history, philosophy, political science, psychology, sociology or world music. Humanities or social science electives may not include technical courses, and must serve to broaden the student's cultural background.

Technical electives must be approved by the department chairman or the student's advisor. At least three of the technical electives must be electrical engineering courses.

PREREQUISITES

Students must complete the prerequisites for a course before registering in that course. Waivers from prerequisite requirements must be obtained in writing from the department chairman.

Courses in electrical engineering

EE 201 Basic Circuits/Numerical Methods Credit, 3 semester hours

Prerequisites: M 117, PH 150. Ideal circuit elements; resistance, capacitance, inductance; active devices; sources; resistive networks, voltage and current dividers; natural response of first- and second-order systems.

EE 202 Network Analysis I Credit, 3 semester hours.

Prerequisites: EE 201, M 118. Continuation of EE 201. Forced response, transfer functions, complete solutions of differential systems. Sinusoidal steady state techniques. Power, energy, power factor, vars. Three phase power systems analysis.

EE 253 Electrical Engineering Laboratory I

Credit, 2 semester hours

Laboratory exercises and projects include resistance, capacitance and inductance measurement, diode, transistor and operational amplifier characteristics. Measurement of electrical parameters. Characteristics and applications of basic electrical laboratory apparatus. Note: part-time students are charged for a standard three-semester-hour course. Laboratory Fee

EE 301 Network Analysis II Credit, 3 semester hours

Prerequisites: EE 202, M 203. Properties of transfer functions; frequency response curves, bandwidth and quality factor. Mutual inductance and two port parameters. Power, energy and harmonic phenomena in polyphase systems. Fourier series and Fourier transform, ideal filter properties.

EE 302 Systems Analysis Credit, 3 semester hours

Prerequisite EE 301. Continuous and discrete signals, difference equations. State space description of systems. The convolution sum and integral. The Z transform and the Laplace transform.

EE 336 Electrical Engineering Systems Credit, 3 semester hours

Prerequisite: EE 201. Single-phase and three-phase power system properties. Characteristics of rotating machines and transformers. Diodes, transistors and other solid-state devices; amplifying and wave-shaping circuits. Electrical instrumentation techniques. This course is intended for nonmajors.

EE 341 Digital Computer Techniques Credit, 3 semester hours

Prerequisites: M 203, EE 202. Numerical analysis techniques with applications to engineering problems. Design and execution of digital computer algorithms. Digital simulations of dynamic systems.

EE 344 Electrical Machines Credit, 3 semester hours

Prerequisite: EE 202. Fields, forces, torques in magnetic systems. Theory, characteristics and applications of direct current and alternating current machines, including transformers and synchronous and induction machinery.

EE 347-348 Electronics I and II Credit, 6 semester hours

Prerequisite: EE 202. Principles and applications of electronic devices including diodes, rectifiers, transistors, FETs and integrated circuits. Device models, parasitic effects. Single and multistage power and voltage amplifiers, frequency response, design considerations.

EE 349 Electrical Engineering Laboratory II Credit, 2 semester hours

Prerequisite: EE 347. Laboratory exercises and projects. Measurement of diode, transistor and operational amplifier parameters. Amplifying, integrating and oscillating circuits. Design of logic elements. Transformers and electromechanical systems. Part-time students are charged for a standard three-semester-hour course. Laboratory Fee

EE 355-356 Digital Systems I and II Credit, 6 semester hours

Fundamental concepts of digital systems. Boolean algebra and its application to logic design. Map and tabular techniques of minimization. Synchronous and asynchronous sequential systems analysis and design. Applications to logic design problems of digital computers.

EE 361 Electromagnetic Theory Credit, 3 semester hours

Prerequisite: M 203, PH 205. Basic electromagnetic theory including static fields of electric charges and the magnetic fields of steady electric currents. Fundamental field laws. Maxwell's equations, scalar and vector potentials, Laplace's equation and boundary conditions. Magnetization, polatization, field plotting.

EE 363 Electromechanical Energy Conversion

Credit, 3 semester hours

Prerequisites: EE 361 and M 204. Introduction to electromechanical devices, lumped parameter electromechanics; introduction to rotating machinery, equilibrium and stability, fields in moving matter; energy conversion dynamics.

EE 420 Statistical Systems Analysis Credit, 3 semester hours

Prerequisite: EE 301. The elements of probability theory. Continuous and discrete random variables. Characteristic functions and central limit theorem. Stationary random processes and auto correlation. Power density spectrum of a random process.

EE 437 Industrial Power Systems Engineering

Credit, 3 semester hours

Prerequisite: EE 202. Study of the components forming a power system, its economic operation; symetrical components and sequence impedance in the study of faults and load-flow studies.

EE 438 Electric Power Transmission Credit, 3 semester hours

Prerequisite: EE 437. The fundamentals of electric generation, transmission and distribution. Transmission line analysis and performance, circle diagrams. Load-flow studies. Power system stability.

EE 445 Communications Systems Credit, 3 semester hours

Prerequisites: EE 301, EE 420. The analysis and design of communication systems. Signal analysis, transmission of signals, power density spectra, amplitude, frequency and pulse modulation. Performance of communications systems and signal to noise ratio.

EE 446-447 Pulse and Digital Circuits I and II

Credit, 6 semester hours

Prerequisites: EE 301, EE 347. A study of circuits used for digital computers and pulse applications. Linear and non-linear wave-shaping, digital logic circuits, switching circuits, multi-vibrators, voltage comparators, negative resistance switching circuits, voltage and current sweep circuits. Emphasis in the second course on integrated circuit technology and special topics of current interest.

EE 450-451 Analysis and Design of Active Networks I and II

Credit, 6 semester hours

Prerequisites: EE 301, EE 347. Techniques in the analysis and design of active and passive networks. Synthesis of passive networks, the operational amplifier, second-order active networks. Analog, Butter-

worth, and Chebyshev filters. Digital signal processing and additional selected topics.

EE 453 Electrical Engineering Laboratory III

Credit, 2 semester hours

Prerequisite: Senior standing in electrical engineering. Laboratory exercises and projects. This course typically includes work with digital circuitry, analog circuitry, feedback controls, microwave devices. Note: Part-time students are charged for a standard three-semester-hour course.

Laboratory Fee

EE 455 Control Systems Credit, 3 semester hours

Prerequisite: EE 302. Analysis of systems employing feedback. Performance criteria including stability. Design of compensation networks. Techniques of root locus, Routh-Hurwitz, Bode and Nyquist. Introduction to modern control theory including the concept of state.

EE 462 Electromagnetic Waves Credit, 3 semester hours

Prerequisite: EE 361. Electromagnetic wave propagation and reflection in various structures, including coaxial, two wire, and waveguide systems. Various modes of propagation in rectangular, circular and coaxial waveguides. The dipole antenna. Smith chart techniques.

EE 471 Computer Engineering I Credit, 3 semester hours

Prerequisite: EE 355. A study of the architecture and organization of the PDP-11 digital computer. Addressing modes, instruction set, assembler/machine language, coding. Input/output programming, interrupt programming. Programming an A/D and D/A conversion unit.

EE 472 Computer Engineering II Credit, 3 semester hours

Prerequisite: EE 471. Applications of computers to physical systems for monitor control functions. General interface design. Case studies may include: synchronous motor transient studies, shock wave phenomena, dynamic chemical reaction monitoring and control, signal processing, FFT and digital filtering techniques, sampled data control system compensation techniques. Students must complete a project.

EE 500 Special Topics in Electrical Engineering

Credit, 3 semester hours

Prerequisite: Instructor's consent (May be repeated for credit). Open to seniors in electrical engineering. Special topics in the field of electrical engineering. Supervised independent study. Arranged to suit the interest and requirements of the student.

EE 504 Laboratory Thesis Credit, 3 semester hours

Prerequisite: Instructor's consent. Open to seniors in electrical

engineering. Students must submit approved proposal. Advanced laboratory problems. Students work on problems of their selection with the approval of the instructor.

Department of Industrial Engineering

Chairman: Associate Professor William S. Gere Jr., Ph.D., Carnegie-Mellon University.

Professors: Edward T. George, D. Eng., Yale University; Alexis N. Sommers, Ph.D., Purdue University.

Associate Professors: Joseph J. Arnold, M.S., Southern Connecticut State College; Francis J. Costello, M.S.M.E., New Jersey Institute of Technology; Ned B. Wilson, Ph.D., Ohio State University.

Assistant Professors: Frank M. Clifford, M.B.A., University of New Haven; Ronald A. Haberman, M.S.O.R., Florida Institute of Technology; Ira H. Kleinfeld, Eng.Sc.D., Columbia University; Richard A. Montague, M.S.I.E., Columbia University.

INDUSTRIAL ENGINEERING

The study of industrial engineering prepares a student for a successful career in manufacturing, research and service industries. Based on a broad engineering background, the professional program taken in the last two years offers a perspective which enables the graduate to cope with complex problem situations encountered in modern industry. Special attention is given to preparing the student for the intelligent use of computers in modern industrial practice. Upon satisfactory completion of the prescribed four-year curriculum, graduates will receive the Bachelor of Science in Industrial Engineering.

Students in the industrial engineering major maintain a student chapter of the American Institute of Industrial Engineers. The student chapter operates under its own management but is affiliated with the local senior chapter. Students often attend the local meetings of the professional chapter, developing their sense of professional identity.

COMPUTER TECHNOLOGY

The program in computer technology is designed to produce a graduate who has the ability to take control of a computer complex. Programming in several languages and the organization and association of computer machinery are treated in depth. A strong base in mathematics, physics and general business techniques and practices enables the graduate to work intelligently in either a business or engineering environment. Graduates are awarded the Bachelor of Science in Computer Technology.

Requirements for the degree Bachelor of Science in Industrial Engineering

A total of 128 to 132 credits are required for the Bachelor of Science in Industrial Engineering degree. The freshman year curriculum is common to all engineering disciplines, and has been stated previously.

The industrial engineering major must complete 33 semester hours in specific industrial engineering courses. In addition to specific courses, the student majoring in industrial engineering must complete 12 semester hours of course work, the specific nature of which will be determined in consultation with the student. The student may slant his course of study in one of three directions: 1) industrial management, 2) operations research, 3) computer science.

Required courses include the following: in mathematics, Calculus II and III, M 118 and M 203; Differential Equations, M 204, or Linear Algebra, M 231; and one mathematics elective which may be Probability Analysis, IE 347, or any 300- or 400-series mathematics course.

Also required are Electromagnetism and Optics with Laboratory, PH 205; Statics, CE 201; The Western Tradition in Literature II, E 202; Strength of Materials I, CE 202; Dynamics, ME 204; Engineering Graphics, ME 101; and an elective in physics.

Economics courses are required as follow: Principles of Economics I, EC 133; and Economics of Labor Relations, EC 350. In electrical engineering, students must take the following courses: Basic Circuits/Numerical Methods, EE 201; and Electrical Engineering Systems, EE 336.

Industrial engineering courses are required as follow: Engineering Economics, IE 204; Advanced FORTRAN Programming, IE 224; Work Analysis, IE 243; Statistical Analysis, IE 346; Management Theory, IE 214; Production Control, IE 234; Operations Research,

IE 502; Cost Control, IE 233; Facilities Planning, IE 443; and Senior Laboratory Project, IE 504.

Electives are required as follow: four technical electives, one free elective and two electives from the humanities or the social sciences. Technical electives must be selected with consultation of the advisor and approval of the department chairman. Generally, technical electives must be junior- or senior-level courses in the areas of engineering, mathematics or physics.

REQUIREMENTS FOR THE MINOR

A total of 18 semester hours in the industrial engineering discipline is required for the minor. These courses must be taken: Introduction to Computers: FORTRAN, IE 102; Engineering Economics, IE 204; Work Analysis, IE 243; Production Control, IE 234; Cost Control, IE 233; and Facilities Planning, IE 443.

Engineering majors may substitute other industrial engineering courses for a minor. Prerequisites for these courses must be met by all students pursuing the minor.

Requirements for the degree Bachelor of Science in Computer Technology

A total of 124 to 130 semester hours is required for the Bachelor of Science in Computer Technology. The freshman year curriculum in computer technology is not the same as most other engineering disciplines, and is included in the following description of required courses.

Majors in computer technology are required to complete 39 semester hours of work in courses that are specifically related to computer technology. In addition to the above, the student is required to complete 18 semester hours in the industrial engineering discipline.

Required courses include the following: Pre-Calculus Mathematics, M 115, unless the student has sufficient preparation to be placed directly into Calculus I; Calculus I and II, M 117 and M 118; Composition, E 105; The Western Tradition in Literature I and II, E 201 and E 202; Writing for Business and Industry, E 220; History of Science, HS 121; Introduction to Engineering, ES 107; Engineering Graphics, ME 101; Introduction to Psychology, P 111; and Sociology, SO 113.

Physical Education I and II, PE 111 and PE 112, are required

courses for which no credit is given. Leisure Living, PE 100, may be substituted for PE 111 and PE 112 for three-semester-hours' credit.

Two physics courses are required: Mechanics, Heat and Waves with Laboratory, PH 150; and Electromagnetism and Optics with Laboratory, PH 205. Two electrical engineering courses are required: Digital Systems I and II, EE 355 and EE 356. Two economics courses are required: Principles of Economics I, EC 133; and Economics of Labor Relations, EC 350.

The following industrial engineering courses must be taken: Introduction to Computers: COBOL, IE 105; Introduction to Data Processing, IE 107; Advanced COBOL Programming, IE 225; Introduction to Computers: FORTRAN, IE 102; Advanced FORTRAN Programming, IE 224; Management Theory, IE 214; Statistical Analysis, IE 346; Engineering Economics, IE 204; Cost Control, IE 233; Production Control, IE 234; PL/1, IE 332; Terminal and Remote Job Entry Systems, IE 231; Assembler Language, IE 334; and Hardware Operation, IE 336.

Further industrial engineering requirements are: Operations Research, IE 502; Operating Systems, IE 320; APL/BASIC/RPG, IE 325; Simulations and Applications, IE 335; and Computer Facilities Design, IE 420.

Nine semester hours of electives must be selected from the humanities or the social sciences.

REQUIREMENTS FOR THE MINOR

Students may satisfy requirements for the minor in computer technology by completing 18 semester hours as follow: Introduction to Computers: FORTRAN, IE 102; Advanced FORTRAN Programming, IE 224; Advanced COBOL Programming, IE 225; Assembler Language, IE 334; Hardware Operation, IE 336; and Terminal and Remote Job Entry Systems, IE 231.

Other computer courses may be substituted by engineering majors who wish a minor in computer technology. Prerequisites for the courses must be met by all students pursuing the minor.

Courses in industrial engineering

IE 102 Introduction to Computers: FORTRAN

Credit, 3 semester hours

Prerequisite: M 109 or equivalent. An introductory course in computers and FORTRAN for engineering and science students. The student is taught the basics of the FORTRAN language. The roles of problem analysis, program analysis and programming techniques are presented. Several problems are programmed and debugged by the student and run on the campus computer facility. Laboratory Fee

IE 104 Computer Systems Design Credit, 3 semester hours

Introduction to methods of evaluating corporate computer facility needs as a result of defined job type and job mix. Techniques are examined for effective determination of vendor offerings in terms of hardware and software capabilities to accommodate corporate needs. Laboratory Fee

IE 105 Introduction to Computers: COBOL Credit, 3 semester hours

Prerequisite: M 109 or equivalent. An introductory course in the application of the computer to the needs of today's society for business, social science and art students. Student use of data processing facilities of campus computer center, problem solving, logic theory and the understanding of software packages are put into practice. Students learn how to develop flow charts and write and debug programs in COBOL.

Laboratory Fee

IE 106 Safety Organization and Management

Credit, 3 semester hours

Prerequisite: P 111. History and development of safety movement, nature and extent of problem, development of workmen's compensation, development of safety program, cost analysis techniques, locating and defining accident sources, analysis of the human element, employee training, medical service and facilities and the what and how of the Occupational Safety and Health Act.

IE 107 Introduction to Data Processing Credit, 3 semester hours

Introduction to the concepts, capabilities and limitations of electronic data processing. Use of network systems, software packages and computer services. Project oriented; no programming required. (For programming techniques and the above refer to IE 105.)

IE 119 Industrial Safety and Hygiene Credit, 3 semester hours

Prerequisite: IE 214 or MG 125. Not to be taken by students majoring in occupational safety and health: A basic course in industrial accident prevention and industrial hygiene covering: managerial accident prevention functions and responsibilities; injury data development, usage, and validity; machine guarding techniques and guard development including point-of-operation drives; personal protective equipment; fire prevention and control including flammable solvents, dusts, and their characteristics; electrical hazards; hand tools, power and manual; employee training; communications; hazard analysis; accident investigation. Industrial hygiene problems caused by solvents, dusts, noise, and radiation are studied, as well as regulatory bodies, laws and catastrophe hazards.

IE 201 Accident Conditions and Controls Credit, 3 semester hours

Prerequisite: IE 106. Mechanical hazards, machine and equipment guarding, boilers and pressure vessels, structural hazards, materials handling hazards and equipment use, electrical hazards, personal protective equipment.

IE 204 Engineering Economics Credit, 3 semester hours

Prerequisite: M 116 or M 117. A quantitative analysis of applied economics in engineering practice; the economy study for comparing alternatives; interest formulae; quantitative methods of comparing alternatives; intangible considerations; selection and replacement economy for machines and structures; break-even and minimum cost points; depreciation; relationship of accounting to the economy study; review of current industrial practices; Promotes logical decisions through the consideration of alternative courses of action.

IE 214 Management Theory Credit, 3 semester hours

Prerequisite: Junior or senior status. Provides insight into the elements of the managerial process and develops a rational synthesis of the mass of detail comprising the subject matter of management. Focusing largely upon the complex problems of top- and middle-level management, this course investigates what managers do under given circumstances, yet stresses the on-going activities of management as part of an integrated, continuous process.

IE 216 Elements of Industrial Hygiene Credit, 3 semester hours

Prerequisites: IE 106, PH 103, PH 104, CH 103. Analysis of toxic substances and their effect on the human body. Analysis and effect of chemical hazards, physical hazards of electromagnetic and ionizing radiation, abnormal temperature and pressure, noise, ultrasonic and low-frequency vibration; sampling techniques including detector tubes, particulate sampling, noise measurement, and radiation detection; governmental and industrial hygiene standard codes. Laboratory Fee

IE 217 Industrial Safety and Health Legal Standards

Credit, 3 semester hours

Prerequisites: IE 106, IE 201. All aspects of the legal constraints applicable to the occupational safety field are examined. Included are OSHA, federal laws not under OSHA jurisdiction, selected state Igislation, current and pending product liability laws, environmental protection laws and fire safety codes. Consideration will be made for emphasizing particular legal areas as requested.

IE 223 Personnel Administration Credit, 3 semester hours

Prerequisite: IE 214 or MG 125. Provides a foundation in fundamental concepts and a general knowledge of techniques in the administration of personnel relations. The nature of personnel administration, the handling of personnel problems, employee attitudes and morale. Techniques

of personnel administration: recruitment, interviews, placement, training, employee rating, as well as wage policies and administration. In order to secure breadth and depth in the approach to personnel problems, simple case studies are used at appropriate points throughout the course.

IE 224 Advanced FORTRAN Programming

Credit, 3 semester hours

Prerequisites: IE 102 and M 115. Introduces the student to advanced FORTRAN programming and encourages student use of the campus computer facility and its peripheral devices. Various typical engineering and scientific computer applications are discussed and demonstrated. Problem solving innovations are presented. Laboratory Fee

IE 225 Advanced COBOL Programming Credit, 3 semester hours

Prerequisite: IE 105. Introduces the student to advanced techniques in programming and debugging programs written in COBOL for the campus computer. Various typical systems, analyses and applications are discussed and demonstrated. Laboratory Fee

IE 231 Terminal and Remote Job Entry Systems

Credit, 3 semester hours

Prerequisite: IE 102 or IE 105. Introduction to the philosophy of terminal usage and remote job entry systems. Appropriate development of control, protection and integrity of programs and files accessible by a multitude of users. Review of data communications network. The BASIC language is introduced. Laboratory Fee

IE 233 Cost Control Credit, 3 semester hours

Prerequisite: M 115. Basic analysis of cost control techniques. Designed to give members of the management team the underlying rudiments of cost control systems they will be using and by which they will be measured and controlled. Theory of standard costs, flexible budgeting, and overhead handling techniques emphasized by analytical problem solution.

IE 234 Production Control Credit, 3 semester hours

Prerequisites: IE 214 or MG 125, and M 115. The basic principles that govern production control in an industrial plant. These principles are worked out in the problems of procuring and controlling materials, in planning, routing, scheduling and dispatching. Familiarizes the student with present and new methods used in this field including O.R. techniques.

IE 243 Work Analysis Credit, 3 semester hours

Prerequisite: M 115. An introductory course in motion analysis, methods analysis, and work measurement. Motion and methods analysis techniques include the principles of motion economy, process analysis charting, operations analysis, activity analysis, and work design layout analysis. Students are required to design a work place project which will be filmed

on closed-circuit television for analysis. Work measurement includes an introduction to time study fundamentals and predetermined time systems. Laboratory Fee

IE 320 Operating Systems Credit, 3 semester hours

Prerequisites: IE 102 or IE 105, IE 336. Introduction to operating systems, job control language and general structure of operating systems. Priority control structure and input/output routines with interrupt level and cycle-stealing philosophy also included. Laboratory Fee

IE 325 APL/BASIC/RPG Credit, 3 semester hours

Prerequisite: IE 231. Exposure to the use of languages developed specifically for terminal use in an attempt to acquaint the student with instantaneous programming and problem solving via a centralized computer facility. Laboratory Fee

IE 332 PL/I Credit, 3 semester hours

Prerequisite: IE 224 or IE 225. Development of the use of PL/1, a combination business-oriented and scientific/engineering-oriented, high-level computer language. Laboratory Fee

IE 334 Assembler Language Credit, 3 semester hours

Prerequisite: IE 224 or IE 225. Description of the functional characteristics of a computer main storage and peripheral unit structure along with the monitoring system control function via the use of the Assembler language. Laboratory Fee

IE 335 Simulations and Applications Credit, 3 semester hours

Prerequisite: IE 224. Evaluation of mathematical modeling of a system (business or scientific/engineering oriented) geared toward program simulation. Canned simulation programs (e.g., Business Games, GASP, GPSS) will be evaluated and run. Laboratory Fee

IE 336 Hardware Operation Credit, 3 semester hours

Prerequisite: IE 224 or IE 225. Hands-on computer operation of programs written by the student. Use of all I/O devices will be included along with description of disk montitoring system control.

Laboratory Fee

IE 344 Advanced Work Analysis Credit, 3 semester hours

Prerequisite: IE 243. A course extending the principles introduced in the prerequisite course including the development of standard data systems, formula construction in standard data, methods-time-measurement and master standard data predetermined time system, work sampling, standards on indirect work, wage payment plans, and the use of closed circuit television as a methods training tool. Laboratory Fee

IE 346 Statistical Analysis Credit, 3 semester hours

Prerequisite: M 118. Provides an introduction to the application of statistical techniques to industrial and engineering problems, probability and distribution theory, measures of central tendency and dispersion in relation to population and samples, as well as applications of algebraic methods in industrial practice, including advanced statistical methods. Special sections are offered for students in the social sciences.

IE 347 Probability Analysis Credit, 3 semester hours

Prerequisite: QA 216 or IE 346. Develops the theory of probability and related applications. Introduces such relevant areas as: combinations and permutations, probability space, law of large numbers, random variables, conditional probability, Bayes's Theory, Markov chains and stochastic processes.

IE 420 Computer Facilities Design Credit, 3 semester hours

Prerequisites: IE 233, IE 243, IE 502. Introduction to the design and evaluation of computer installations and physical utilization. Analysis techniques including facilities layout, work flow, environmental design and human factors are utilized in the development of typical computer installations. Laboratory Fee

IE 436 Quality Control Credit, 3 semester hours

Prerequisite: IE 346. Economics of quality control; modern methods used by industry to achieve quality of product; preventing defects; organizing for quality; locating chronic sources of trouble; coordinating specifications, manufacturing, and inspection; measuring process capability; using inspection data to regulate manufacturing processes; control charts; selection of modern sampling plans.

IE 443 Facilities Planning Credit, 3 semester hours

Prerequisites: IE 243, IE 204. Factors in plant location, design and layout of equipment. The basic principles of obtaining information essential for carrying out such investigations. Survey of such practices as material handling, storage and storeroom maintenance and use of service departments in modern factories. Laboratory Fee

IE 502 Operations Research Credit, 3 semester hours

Prerequisite: QA 216 or IE 346. The operations research area is oriented to various mathematical and near-mathematical methods for getting answers to certain kinds of business problems. Simulation including Monte Carlo, queuing, the Flood method for assigning jobs, the transportation method, and linear programming including the simplex method with both algebraic solution and tableaus.

IE 504 Senior Laboratory Project Credit 3 or 4 semester hours

Prerequisite: senior I.E. status. Advanced laboratory testing and special problems. The student works on problems of his own selection which have been outlined by him and have received approval. They may be in the form of a semester thesis or a series of original experiments.

IE 507 Systems Analysis (General) Credit, 3 semester hours

Prerequisite: junior status. Presents the analytical and conceptual techniques upon which systems analysis and development is based, and applications to nonbusiness as well as business operations. Development of case studies and their applications independently oriented to the student's major area of interest.

IE 508 Systems Analysis (Business and Engineering)

Credit, 3 semester hours

Prerequisites: IE 214 or MG 125, and M 115. Presents the analytical and conceptual techniques upon which systems analysis and development is based, and applications to business and industrial fields. Development of case studies and their applications independently oriented to the student's major area of interest.

IE 510 Business Games Credit, 3 semester hours

Prerequisites: IE 214 or MG 125; and QA 216 or IE 346. The business games area gives the student the opportunity to correlate his entire course of study in a management simulation framework. These training games make use of simulation models that explore specific management areas in depth. Operations research techniques of scientific management are developed.

Department of Mechanical Engineering and Materials Engineering

Chairman: Associate Professor, Richard J. Greet, Ph.D., Harvard University.

Professors: Konstantine C. Lambrakis, Ph.D., Rensselaer Polytechnic Institute; Ivan Lobay, M.E., Central University of Venezuela, Professional Engineer, Connecticut; Thomas C. Warner Jr., M.S., Massachusetts Institute of Technology, Professional Engineer, Connecticut.

Associate Professor: Buddy B. Saleeby, Ph.D., Northwestern University.

Assistant Professor: John Sarris, Ph.D., Tufts University.

MECHANICAL ENGINEERING

The Department of Mechanical Engineering has a long history of success in producing outstanding graduates in the field of thermal sciences, fluids and design. To insure that graduates will continue to distinguish themselves in either graduate school or the practice of engineering, the department places emphasis on the scientific foundation of the curriculum and on the breadth and scope of the professional courses. Implicit in this emphasis is a demand for a high level of maturity and flexibility on the part of the student.

The rapid advances in science and technology require that mechanical engineers, as generalists among engineers, not only have a thorough understanding of basic scientific principles, but also have an appreciation of human values and an awareness of the effects of their contribution to the social, professional, economic and ecological climate in which they work.

Several options for concentration at the senior year are available for a student to pursue. At that level, restricted elective courses may be selected, with the help of the student's faculty advisor, which offer the opportunity for further learning in areas such as fluids, energy, design, heat transfer, numerical analysis and computers, aerospace sciences and control systems. Plans to extend the curriculum to incorporate studies in nuclear and chemical engineering are under consideration.

Exceptional students having an overall average of 3.5 or better may join the Delta Zeta Chapter of Pi Tau Sigma Honorary Fraternity which provides the opportunity for closer relations with the faculty and other prominent individuals in the field for the purpose of further professional development, involvement in faculty research and varied social and intellectual activities.

Membership in the American Society of Mechanical Engineers student section is open to all mechanical engineering students of good standing, and provides the opportunity for field trips to local industrial establishments, social activities and reading of interesting professional literature.

MATERIALS ENGINEERING

The performance of virtually every electrical, mechanical and structural device is limited ultimately by the materials from which it is made. The materials engineer is the expert on materials selection. He must weigh the relative merits of metals against plastics, and specify materials for everything from ceramic magnets to aerospace composite fiber materials. The materials engineer is also the

controller of materials processing during manufacture. This might include such diverse specialities as powder metallurgy, plastic extrusion, metal heat treatment and vapor deposition, to name but a few fabrication techniques.

The Bachelor of Materials Engineering degree program provides a broad core curriculum to develop an understanding of the fundamental principles common to all materials. It also incorporates elective courses to enable the student to specialize in a particular materials engineering field.

A student chapter of the American Society for Metals permits students to keep abreast of the professional developments in materials.

Requirements for the degree Bachelor of Science in Mechanical Engineering

A total of 131 to 134 semester hours of credit is required for the Bachelor of Science in Mechanical Engineering. The freshman year curriculum is the same core program as most other engineering disciplines and has been stated previously.

Requirements for the second, third and fourth years are the following: in mathematics, Calculus II and III, M 118 and M 203; Differential Equations, M 204; and one mathematics elective. In basic science: Electromagnetism and Optics with Laboratory, PH 205; and one science elective.

In humanities: Principles of Economics I, EC 133; one literature elective; and two additional humanities electives. In general engineering: Statics, CE 201; Strength of Materials I, CE 202; Basic Circuits/ Numerical Methods, EE 201; Electrical Engineering Systems, EE 336; Engineering Economics, IE 204; and Engineering Materials, MT 200.

Mechanical engineering requirements are the following: Engineering Graphics, ME 101; Dynamics, ME 204 Thermodynamics I and II, ME 301 and ME 302; Strength of Materials II, ME 307; Machine Elements, ME 311; either Mechanical Design, ME 312, or Introduction to Gas Dynamics, ME 322; Mechanical Engineering Laboratories numbers 1 and 2, ME 315 and ME 415; Mechanics of Vibration, ME 344; Heat and Mass Transfer, ME 404; Turbomachinery, ME 406; three technical electives; and one free elective.

Requirements for the degree Bachelor of Science in Materials Engineering

The Bachelor of Science in Materials Engineering requires 127 to 131 semester hours of credit for completion. The freshman

year curriculum is the same for most engineering programs and has been stated previously.

Requirements for the second, third and fourth years are the following: in mathematics, Calculus II and III, M 118 and M 203; Differential Equations, M 204. In basic science: Electromagnetism and Optics with Laboratory, PH 205; one chemistry elective; and one additional science elective.

In humanities: Principles of Economics I, EC 133; one literature elective; and two additional humanities electives. In general engineering: Statics, CE 201; Strength of Materials I, CE 202; Basic Circuits/ Numerical Methods, EE 201; Electrical Engineering Systems, EE 336; Engineering Economics, IE 204; Engineering Graphics, ME 101; Dynamics, ME 204; and Thermodynamics I, ME 301.

Materials engineering requirements are the following: Physical Metallurgy, MT 219; Electronic Materials, MT 220; Mechanical Behavior of Materials, MT 304; Materials Laboratory: Metallography, MT 309; Materials Laboratory: Heat Treatment, MT 310; Nonferrous Metallurgy, MT 331; Steels and Their Heat Treatment, MT 342; Research Project, MT 500; two materials electives; three technical electives; and one free elective.

Courses in engineering science

ES 103 Technology in Modern Society Credit, 3 semester hours

Scientific and technological developments and their implications for the future of society. Prospects and problems in communications, energy sources, automation, transportation and other technologies. Use and control of technological resources for public benefit.

ES 107 Introduction to Engineering Credit, 3 semester hours

Prerequisite: M 115 (may be taken concurrently). Overview of the problems, perspectives and methods of the engineering profession. Modeling of real world problems for purposes of optimization, decision making and design. Practical techniques of problem formulation and analysis.

Courses in mechanical engineering

ME 101 Engineering Graphics Credit, 3 semester hours

An introduction to the principles and techniques of graphic communication. Fundamentals of orthographic projections; sections; applied geometry; auxiliary views; analysis of point, line, and plane relationships; detail and assembly drawing of simple machine parts.

ME 102 Engineering Drawing and Design Credit, 3 semester hours

Prerequisite: ME 101. For technical students and draftsmen, covering layout of assembly drawings; detailing of their parts, properly dimensioned, for interchangeable manufacture; use of ASA tables of metal fits for machine parts; use of threads and fasteners with the use of tolerances and limits.

ME 124 Mechanical Processes Credit, 3 semester hours

Mill and manufacturing processes. The casting of metals, pattern making, and mold preparing. Fabricating, metal cutting, and welding. Demonstrations, laboratory and inspection trips to local manufacturing plants.

ME 204 Dynamics Credit, 3 semester hours

Prerequisites: CE 201 or CE 205 and M 118 (M 118 may be taken concurrently). Kinematics and dynamics of particles and rigid bodies with emphasis on two dimensional problems. Vector representation of motion in rectangular, polar and natural coordinates. Impulse-momentum and work-energy theorems. Rigid bodies in translation, rotation and general plane motion.

ME 301 Thermodynamics I Credit, 3 semester hours

Prerequisites: M 118. Classical thermodynamics treatment of first and second laws. Thermal and caloric equations of state. Closed and open systems, and steady flow processes. Absolute temperature, entropy, combined first and second laws. Introduction to statistical thermodynamics: particle distributions, statistical concept of entropy, and relation to macroscopic properties.

ME 302 Thermodynamics II Credit, 3 semester hours

Prerequisites: ME 301, and M 203 (M 203 may be taken concurrently). Extensions and applications of first and second laws: availability, combustion process, phase and chemical equilibrium, ideal gas mixtures. Maxwell's relations. Steam power and refrigeration cycles. Internal combustion engine and gas turbine cycles. Irreversible thermodynamics.

ME 307 Strength of Materials II Credit, 3 semester hours

Prerequisite: CE 202. Elastic and plastic behavior of structural elements such as beams, columns and shafts under direct and combined loading. Ultimate strength design, theory of failure, composite member design and an introduction to statically indeterminate structures.

ME 311 Machine Elements Credit, 3 semester hours

Prerequisite: CE 202. Analysis and design of machine elements to meet specified operating conditions. Stresses, deformations and other factors in design of machine parts. Application to machine elements such as joints, shafts, gears, couplings, brakes, clutches and flexible power-transmitting elements.

ME 312 Mechanical Design Credit, 3 semester hours

Prerequisite: ME 307 or instructor's consent. Continuation of ME 311. Design projects, selected individually, developed by the student.

ME 315 Mechanical Engineering Laboratory No. 1

Credit, 2 semester hours

Prerequisites: CE 202, ME 204. Students conduct selected tests in the fields of mechanics of materials and vibrations. Emphasis placed on organization of the experiment, measurement techniques, sources of error and organization of the report. Students are required to design, conduct and present one experiment of their own. Note: Part-time students are charged for a standard three-semester-hour course. Laboratory Fee

ME 321 Fluid Mechanics Credit, 3 semester hours

Prerequisites: ME 204 and M 203. Fluid kinematics: Continuity equation, vector operations. Momentum equation for frictionless flow: Bernouli equation with applications. Irrotational flow: velocity potential, Laplace's equation, dynamic pressure and lift. Steam function for incompressible flows. Rotational flows: vorticity, circulation, lift, and drag. Integral momentum analysis. Navier Stokes equation: stress tensor, Newtonian fluid. Boundary layer approximations.

ME 322 Introduction to Gas Dynamics Credit, 3 semester hours

Prerequisites: ME 302 and ME 321 (ME 321 may be taken concurrently). Compressible fluid flow with emphasis on one-dimensional ducted steady flows with heat transfer, frictional effects, shock waves, and combined effects. Introductory considerations of two- and three-dimensional flows. Occasional demonstrations will accompany the lectures.

ME 335 Tool Design Credit 3 semester hours

Prerequisites: CE 201 and ME 124 (ME 124 may be taken concurrently). Basic techniques of tool design, methods analysis, drill jig design, tolerances and allowances, cutting tools, die design, gauges, and fixtures.

ME 336 Tool Engineering Credit, 3 semester hours

Prerequisite: ME 335 or Instructor's Consent. A continuation of ME 335 with emphasis on economics, estimating and process planning. Students design projects requiring the complete planning and designing necessary to manufacture machine parts.

ME 343 Mechanisms Credit, 3 semester hours

Prerequisite: ME 204. Graphic and analytical methods for deter-

mining displacements, velocities and accelerations of machine components. Application to simple mechanisms such as linkages, cams, gears.

ME 344 Mechanics of Vibration Credit, 3 semester hours

Prerequisite: ME 204. The mathematical relationships necessary for the solution of problems involving the vibration of lumped and continuous systems; damping; free and forced motion; resonance, isolation; energy methods; balancing; single, two and multiple degrees of freedom; vibration measurement.

ME 401 Mechanical Systems Analysis Credit, 3 semester hours

Prerequisites: ME 204, M 204. Dynamic systems and their characteristics. Analogy of electrical, mechanical, and other systems. Mixed systems; Dimensional Analysis; Design considerations.

ME 403 Introduction to Flight Propulsion Credit, 3 semester hours

Prerequisites: ME 322 and Instructor's consent. A senior course designed for those students who intend to work or pursue further studies in the aerospace field. Among the topics covered are: detonation and deflagration, introductory one-dimensioal non-steady gas flows, basic concepts of turbomachinery, and survey of the contemporary propulsive devices. Shock tubes, supersonic wind tunnels and flame propagation demonstrations will accompany the lectures.

ME 404 Heat and Mass Transfer Credit, 3 semester hours

Prerequisites: ME 302, ME 321, and some knowledge of differential equations (ME 321 may be taken concurrently). Conduction in solids, solution of multi-dimensional conduction problems, unsteady conduction, radiation, boundary layer and convection. Introduction to mass transfer. The lectures will include occasional demonstrations of convection, radiation, heat exchangers.

ME 405 Advanced Mechanical Design Credit, 3 semester hours

Prerequisite: ME 321. Selected and advanced topics related to the design of machine elements such as hydrodynamic theory of lubrication and principles of hydraulic machines with application to hydraulic couplings.

ME 406 Turbomachinery Credit, 3 semester hours

Prerequisites: ME 302 and ME 321. Review of basic thermodynamics and fluid mechanics. Dimensional analysis. Specific speed. Classification of turbomachines. Cavitation. Losses. Definitions of efficiency. Theories of turbomachines. Design considerations for stator blades and rotor blades. Computer-aided design.

ME 407 Solar Energy Thermal Processes Credit, 3 semester hours

Prerequisites: ME 321, ME 404 (concurrently). Introduction to the fundamentals of solar energy thermal processes including solar radiation, flat plate and focusing collectors, energy storage, hot water, heating, cooling and auxiliary system components. Emphasis on the design and evaluation of systems as they pertain to commercial and residential buildings.

ME 408 Advanced Dynamics Credit, 3 semester hours

Prerequisites: ME 204, M 204. Plane and spatial motion of particles and rigid bodies, inertia tensor, relative motion, gyroscopes, central force motion, Lagrangian and Hamiltonian methods.

ME 410-411 Introduction to Nuclear Engineering I & II

Credit, 6 semester hours

Prerequisite: M 204. The fundamental scientific and engineering principles of nuclear reactor systems. Reactor design and behavior related to fission process, its associated radiations and engineering principles.

ME 415 Mechanical Engineering Laboratory No. 2

Credit, 2 semester hours

Prerequisites: ME 302, ME 321, and ME 404. A survey of experiments and laboratory investigations covering the areas of fluid mechanics, thermodynamics, heat transfer and gas dynamics. Note: Part-time students are charged for a standard three-semester-hour course. Laboratory Fee

ME 512 Senior Seminar Credit, 3 semester hours

Open to seniors with chairman's approval. An independent design, theoretical analysis, or laboratory investigation as chosen by the student and approved by the chairman of the department. The work is performed by the student with frequent critiques by the responsible faculty member.

ME 599 Independent Study

Credit, 1-3 semester hours per semester with a maximum of 12

Prerequisites: Consent of faculty supervisor and approval of department chairman. Independent study provides an opportunity for the student to explore an area of special interest under faculty supervision.

Courses in materials engineering

MT 200 Engineering Materials Credit, 3 semester hours

Prerequisite: CH 103. A study of the properties of the principal engineering materials of modern technology: Steels and nonferrous alloys and their heat treatment, concrete, wood, ceramics, and plastics. Gives engineers sufficient background to aid them in selecting materials and setting specifications.

MT 219 Physical Metallurgy Credit, 3 semester hours

Prerequisite: CH 105. Introduction to the relationships between atomic structure and macroscopic properties such as mechanical strength and ductility. Atomic bonding, crystallography, phase equilibrium and phase transformations are among the topics considered.

MT 220 Electronic Materials Credit, 3 semester hours

Prerequisite: PH 205. Study of transport and rearrangement of charge to determine electric and magnetic properties of solids. Semiconductors, superconductors and magnetic materials are among the topics considered.

MT 301 Welding Metallurgy Credit, 3 semester hours

Prerequisite: MT 219. Study of welding and brazing procedures of ferrous and nonferrous alloys, with consideration of macro and microstructures of welded members.

MT 302 Polymeric Materials Credit, 3 semester hours

Prerequisite: CH 105. Chemistry and physical properties of rubber and plastic materials. Consideration of both fundamental principles and engineering applications.

MT 304 Mechanical Behavior of Materials Credit, 3 semester hours

Prerequisite: MT 219. Detailed study of elastic and plastic deformation of materials at room temperature and elevated temperatures. Dislocation theory and microplasticity models considered.

MT 309 Materials Laboratory: Metallography Credit, 1½ semester hours

Prerequisite: MT 219. Laboratory preparation of both ferrous and nonferrous samples for microscopic investigation, including photomicroscopy with metallograph microscope.

MT 310 Materials Laboratory: Heat Treatment

Credit, 1½ semester hours

Prerequisite: MT 219. Laboratory documentation of the effects of heat treatment in annealing and hardening both ferrous and nonferrous materials.

MT 324 Nuclear Metallurgy Credit, 3 semester hours

Prerequisite: MT 219. Consideration of nuclear reactors, the production and fabrication of metals and alloys used as reactor components, nondestructive testing and radiation damage of materials.

MT 331 Nonferrous Metallurgy Credit, 3 semester hours

Prerequisite: MT 219. The physical metallurgy of aluminum, copper, magnesium and other nonferrous metals. Alloying, fabrication and consideration of materials properties which make nonferrous metals competitive with steels.

MT 342 Steels and Their Heat Treatment Credit, 3 semester hours

Prerequisite: MT 219. Fundamentals of ferrous physical metallurgy such as iron-carbon phase diagram, transformation diagrams, hardenability and the effects of alloying elements. Heat treating discussed in terms of resulting microstructures and physical properties.

MT 400 Materials Reactions Credit, 3 semester hours

Prerequisite: MT 219. Consideration of chemical reactions in the liquid and solid state of importance to the field of materials engineering. Topics to include extractive metallurgy, internal oxidation, surface treatment and recycling of secondary materials.

MT 401 Materials Analysis Credit, 3 semester hours

Prerequisites: M 204 (may be taken concurrently), MT 219. Mathematical treatment of selected topics of diffusion, phase transformations and mechanical and electrical properties of materials.

MT 500 Research Project Credit, 3 semester hours

Prerequisites: MT 331, MT 342, plus senior status. An independent design, theoretical analysis or laboratory investigation, chosen by the student and approved by the chairman of the department. The work is performed by the student with frequent critiques by a faculty member.

MT 599 Independent Study

Credit, 1-3 semester hours per semester with a maximum of 12

Prerequisites: Consent of faculty supervisor and approval of department chairman. Independent study provides an opportunity for the student to explore an area of special interest under faculty supervision.

Program in Aeronautical Technology

Coordinator: Instructor Richard H. Strauss, B.A., Hawthorne College.

The aviation industry, both commercial and general, is a growing one. It employs 1.2 million people as flight and service personnel and in manufacturing. As the industry continues to expand there will be a need for more personnel with technical skills.

The aeronautical technology program prepares students to meet the demands of the future and the career goals of the individual. The Associate in Science degree in aeronautical technology provides students interested in a career as a professional pilot or in related services with the technical background required for employment. Following completion of the associate's degree, a student may continue for a bachelor's degree in a program from the schools of engineering, business administration or arts and sciences.

The flight training portion of the aeronautical technology program includes private, commercial, instrument, instructor and multi-engine FAA certification, and may be completed at any of the university-approved regional flight schools: New Haven Airways (Tweed-New Haven Municipal Airport), Air Kaman (Bradley International Airport), Coastal Air Services (Trumbull Airport), C & R Conn Air (Brainard Airport) and Danbury Airways (Danbury Municipal Airport).

Requirements for the degree Associate in Science with a major in aeronautical technology

A total of 70 semester hours of credit is required for the Associate in Science degree in aeronautical technology. The program is designed to be completed in two years.

The following aero tech courses are required: Aviation Science-Private, AE 100; Aviation Meteorology, AE 110; Aviation Science-Commercial, AE 130; Concepts of Aerodynamics, AE 140; Aviation Science - Instrument, AE 200; Aircraft Powerplants, Systems and Components, AE 210; and Flight Instructor Seminar, AE 230.

Additionally, the following flight training courses are required: Primary Flight - Solo, AE 105; Private Pilot Flight, AE 115; Commercial Flight I, AE 135; Commercial Flight II, AE 145; Commercial Flight III, AE 205; and Instructor Flight, AE 235, or Multi-Engine Rating AE 245.

General courses required are: Composition, E 105; Composition and Literature, E 110; Principles of Economics I, EC 133; Western Civilization II, HS 112; and two semesters of math or science.

In addition to the aero tech courses listed above, students should select an area of concentration of courses in consultation with the coordinator of aeronautical technology, from a program within the school of engineering, business administration, or arts and sciences. This concentration will prepare students for the continuation of their education toward a bachelor's degree to meet their individual needs and careers.

Courses in aeronautical technology

Flight training costs are based on rates at university approved flight schools. This cost is not included in university tuition charges and should be paid directly to the flight school.

An asterisk (*) indicates flight training courses which may be completed at any of the university approved flight training schools in Connecticut. A student must register for these courses at the university in order to receive course credit and be eligible for related aviation degree programs.

AE 100 Aviation Science—Private Credit, 3 semester hours

Corequisite: AE 110. Basic ground instruction in aircraft systems and controls, FAA regulation, air traffic control, communication, weight and balance, meteorology, navigation, radio facilities and utilization, flight computer and aerodynamic theory. Successful completion of FAA Private Pilot airplane written examination is required.

***AE 105 Primary Flight—Solo** Credit, 1 semester hour

Corequisite: AE 100. Introduction to flight. Concentration on the development of flying skills for solo flight. Course includes ground instruction required for each flight lesson. Minimum flight time requirements: dual instruction-10 hours; link trainer-2 hours; solo-3 hours; discussion-4 hours.

AE 110 Aviation Meterology Credit, 3 semester hours

Discussion and interpretation of atmospheric phenomena including an analysis of aviation forecasts and reports.

***AE 115 Private Pilot Flight** Credit, 2 semester hours

Prerequisite: AE 105. Flight training in preparation for private pilot certification. This course includes solo practice of maneuvers to increase proficiency, cross country flying, and flight test preparation. Private pilot certification is required. Minimum flight time requirements: dual instruction-12 hours; solo-13 hours; discussion-8 hours.

AE 130 Aviation Science—Commercial Credit, 3 semester hours

Prerequisite: AE 100. Corequisite AE 140. Advanced ground instruction in navigation, flight computer, radio navigation, aircraft performance, engine operation, aviation physiology and FAA regulations including FAR Parts 135 and 121. Successful completion of FAA Commercial Pilot airplane written examination is required.

***AE 135 Commercial Flight I** Credit, 2 semester hours

Prerequisite: AE 115. Continuation of flight instruction and practice for the purpose of developing a high degree of judgement and coordination through practice of advanced maneuvers and cross country flights. Minimum flight time requirements: dual instruction-23.0 hours; solo-40.0 hours; ground instruction-8 hours.

AE 140 Concepts of Aerodynamics Credit, 3 semester hours

The study of basic aerodynamics including theory of flight, analysis of the four forces, high lift devices, subsonic, transonic and supersonic flight.

***AE 145 Commercial Flight II** Credit, 2 semester hours

Prerequisite: AE 135. Introduction to basic instrument flying and transition into high performance complex single engine aircraft. Additional cross country and night flying practice. Minimum flight time requirements: dual instruction-22 hours; solo-16.2; link trainer or aircraft (instrument)-7 hours; ground instruction-8 hours.

AE 200 Aviation Science—Instrument Credit, 3 semester hours

Prerequisite: AE 130. Ground instruction in preparation for the FAA Instrument Rating. Study includes a discussion of pertinent regulations, IFR departure, enroute, and arrival procedures, flight planning, instrument approaches, air traffic control procedures and a review of meteorology. Successful completion of FAA Instrument-Airplane written examination is required.

***AE 205 Commercial Flight III** Credit, 2 semester hours

Prerequisite: AE 145. Instrument instruction involving navigation, enroute, holding, and approach procedures. At the completion of this course the student will be qualified for commercial pilot certification as well as instrument pilot rating certification. Commercial and instrument pilot certification is required. Minimum flight time requirements: dual instruction-22 hours; solo-21 hours; link trainer-3 hours; ground instruction-8 hours.

AE 210 Aircraft Powerplants, Systems and Components

Credit, 3 semester hours

Prerequisite: AE 100. Discussion of the fundamentals of design and performance of aircraft engines include methods of construction, lubrication, carburation, engine operating procedures and control. In addition, the theory of operation and analysis of problems associated with aircraft components and systems, involving reciprocating and jet aircraft.

AE 230 Flight Instructor Seminar Credit, 3 semester hours

Prerequisite: AE 200. Discussion of the fundamentals of instruction with specific emphasis on teaching as related to the flight instructor. Detailed study and analysis of maneuvers and topics required of the flight instructor. In addition, emphasis will be placed on practice teaching. Successful completion of FAA written examinations (Flight Instructor Airplane and Fundamentals of Instructing) is required.

*AE 235 Instructor Flight — Credit, 1 semester hour

Prerequisite: AE 205. Flight instruction flight training in preparation for the FAA Practical Flight Test. Concentration on communication and analysis of maneuvers and procedures. Minimum flight time requirements: dual instruction-15 hours; solo-5 hours; ground instruction-5 hours.

*AE 245 Multi-Engine Rating — Credit, 1 semester hour

Prerequisite: AE 205. Prepares the commercial pilot for the FAA Multi-Engine Rating. Includes discussion of principles of multi-engine flight as well as flight training required for the rating. Multi-engine certification is required. Minimum flight time requirements: dual instruction-approx. 10 hours; ground instruction-approximately 10 hours.

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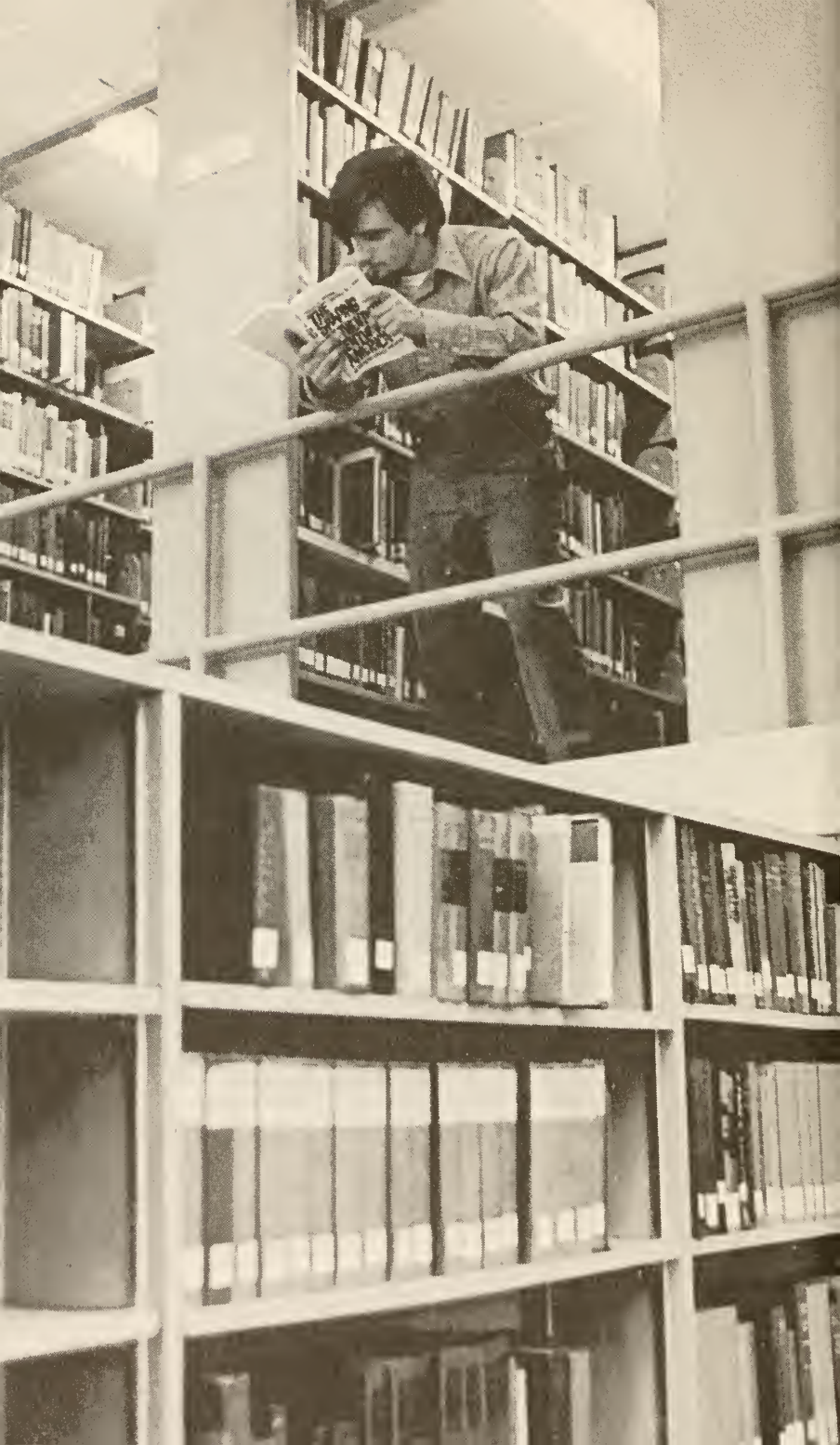

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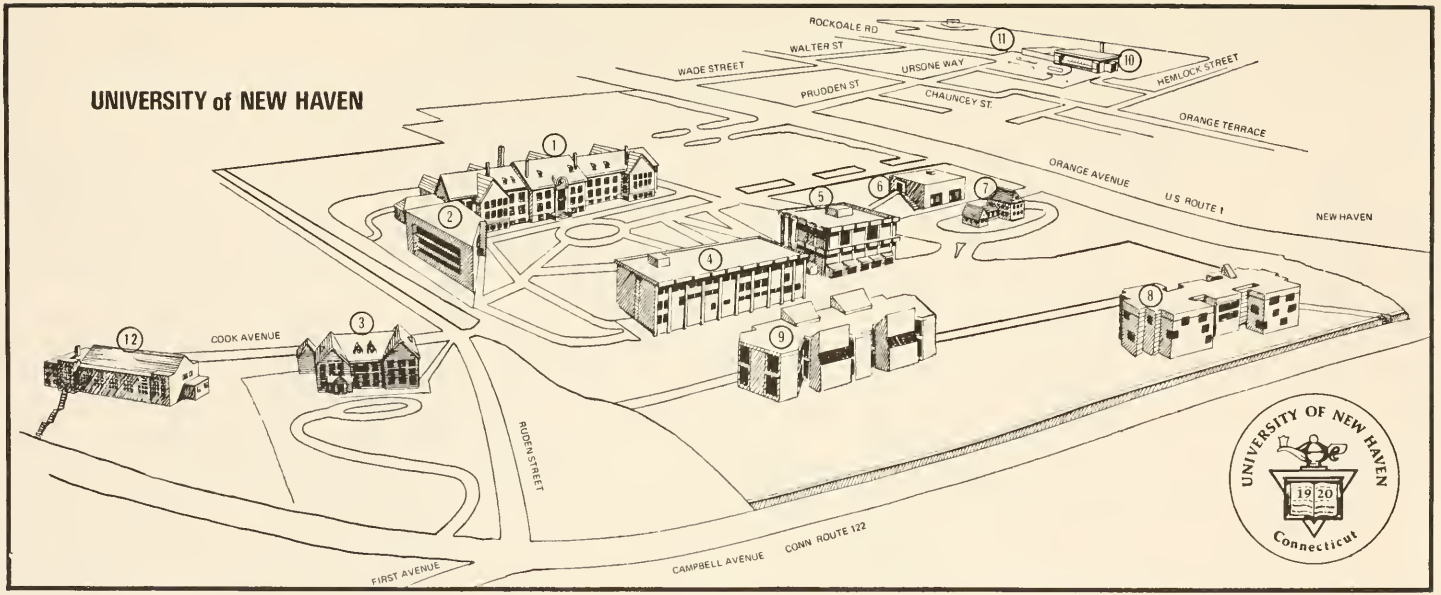
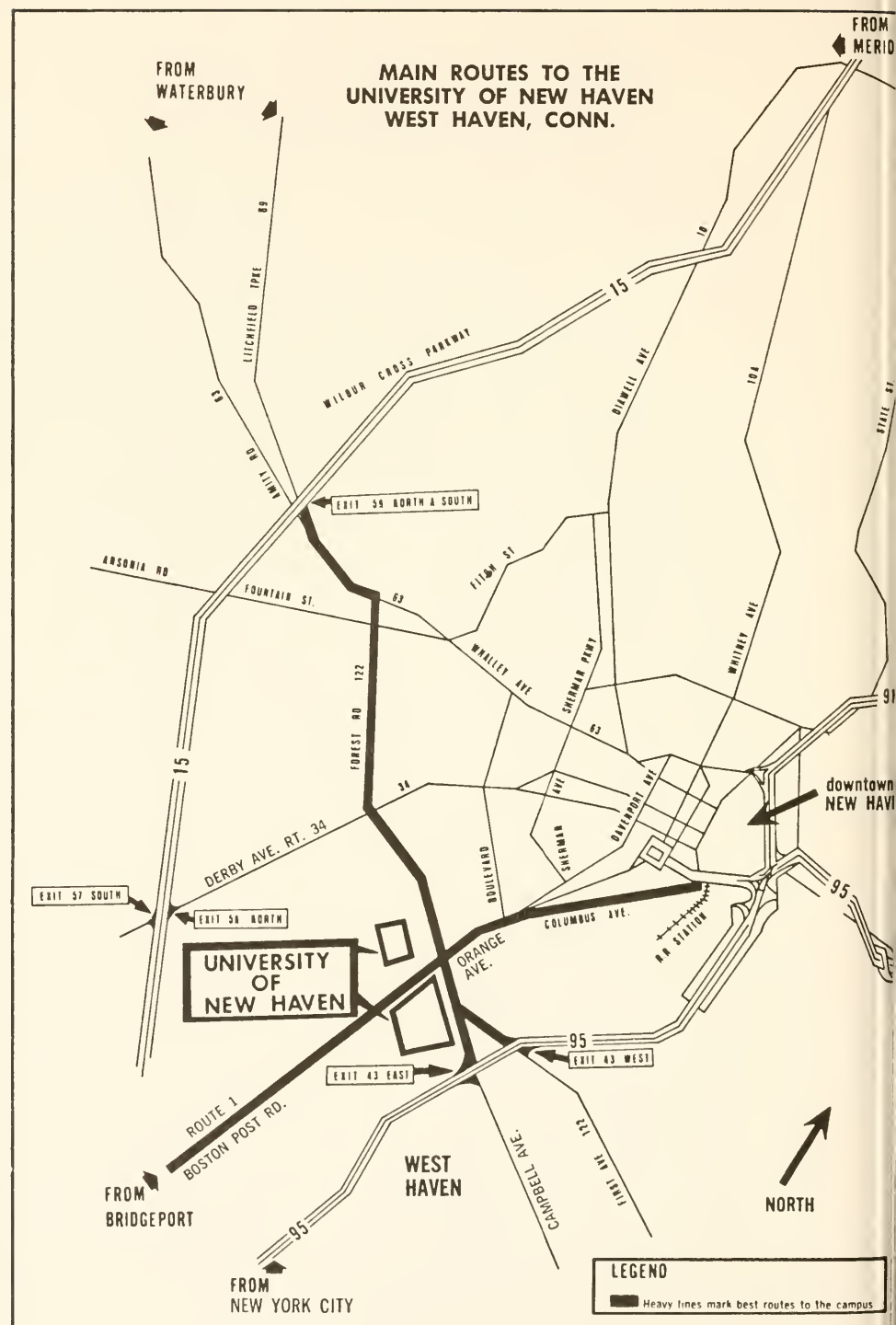


1. Main Building
2. Marvin K. Peterson Library
3. Student Services and Admissions Building
4. Engineering and Science Building
5. Student Center
6. Book Store
7. Gate House
8. Residence Hall
9. Business Administration Classroom Building
10. Gymnasium-Auditorium
11. Athletic Fields
12. Harugari Hall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89
63
AMITY RD
WILBUR CROSS PARKWAY
15
10
DIXWELL AVE
104
STATE ST.
EXIT 59 NORTH & SOUTH
ANSONIA RD
FOUNTAIN ST.
63
FITCH ST
WHALLEY AVE
SHERMAN PKWY
WHITNEY AVE
FOREST RD
122
63
34
15
DERBY AVE. RT. 34
EXIT 57 SOUTH
EXIT 58 NORTH
BOULEVARD
SHERMAN AVE
DAVENPORT AVE
downtown
NEW HAVI
95
COLUMBUS AVE.
R.R. STATION
ORANGE AVE.
UNIVERSITY OF NEW HAVEN
95
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